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Cheese as a Digester.

As a digester (as some not inappropriately call it) cheese—that which is decayed and moldy being preferred by connoiseurs—is often eaten after dinner. The action which experience seems to have proved it to possess, in aiding the digestion of what had previously been eaten, is both curious and interesting, and has had some light thrown upon it by recent chemical research. When the curd of milk is exposed to the air in a moist state for a few days, at a moderate temperature, it begins gradually to decay, to emit a disagreeable odor and to ferment. When in this state, it possesses the property, in certain circumstances, of inducing a species of chemical change and fermentation in other moist substances with which it is mixed or brought into contact. It acts after the same manner as sour leaven does when mixed with sweet dough.

Sour and partially decayed cheese acts in a similar way when introduced into the stomach. It causes chemical changes gradually to commence among the particles of the food which had previously been eaten, and thus facilitates the dissolution which necessarily precedes digestion. It is only some kinds of cheese, however, which will effect this purpose. Those are generally considered the best in which some kind of cheese mold has established itself. Hence the mere eating of a morsel of cheese after dinner does not necessarily promote digestion. If too new, or of impure quality, it will only add to the quantity of food with which the stomach is already overloaded, and will have to await its turn for digestion by the ordinary process.—[Chemistry of Common Life.

Keeping Lemons Fresh

I have been a housekeeper for some years and never till lately have I beenable to keep lemons fresh and juicy to any length of time. But, with all my care—now in this closet, now in that—now wrapped in paper, now packed in bran—now in a cool place, now in a dry one—they would dry up and become hard as wood. Of late, however, I have preserved them perfectly fresh three months in summer, by placing them in a closely covered jar or pot kept in the ice-house. Each lemon is wrapped in paper, (perhaps they would do as well without,) but opened and wiped once in ten or twelve days, then covered again with dry paper, and put back into the jar, or eathern vessel, on the ice.—[American Agriculturist.

American Pearl Fishery.

A company has been formed in Wilmington, Del., for the purpose of pursuing the pearl fishing in South America ; they have purchased a vessel named the *Emily Fanning*, which is now being fitted up for the purpose. The fishing is to be conducted upon a different principle from that pursued with treasure divers ; diving bells being built to accomplish greater results by machines than is now done by human fishers. It is to be hoped that this American enterprise will prove eminently successful.

IMPROVED GOVERNOR FOR WIND MILLS.

Fig. 1

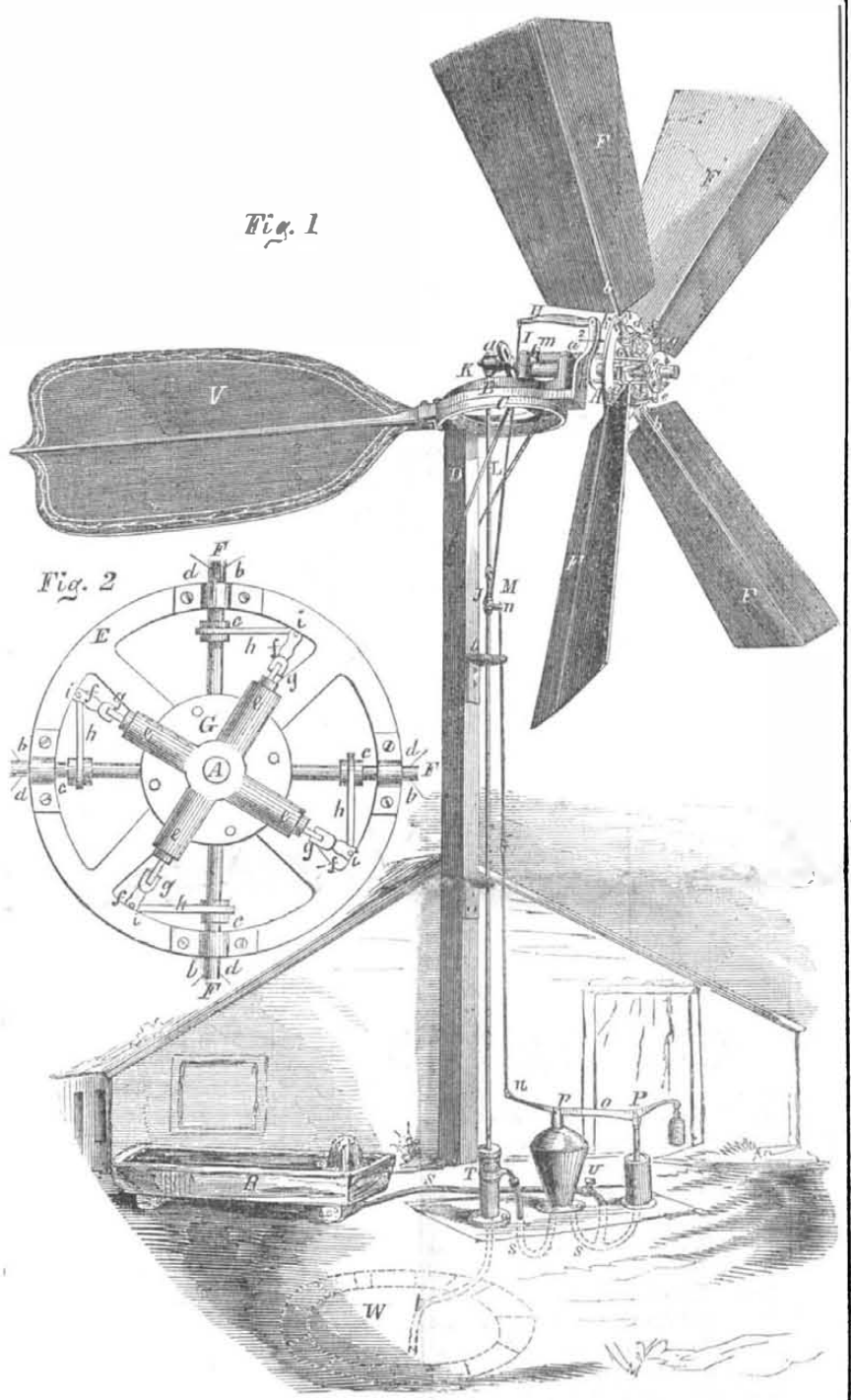

Fig. 2

The annexed engravings are views of an improvement in Wind Mills, for which a patent was granted to Daniel Halladay, of Ellington, Conn., on the 29th of August last.

Figure 1 is a perspective view, and figure 2 is a face view of the wing or sail ring, and parts of the governor. The same letters refer to like parts.

The nature of the invention consists in having the wings or sails attached to movable or rotating spindles having levers or equivalent devices connected to them, said levers being also connected to a head with wings rotating on the same shaft. The head has a lever connected to it, which is operated by a governor that slides the head upon the shaft, and causes the levers or their equivalents to turn the wings or sails, so as to present a proper resisting surface to the wind, and thereby produce a uniform velocity of the sails, which are made to have a greater or less obliquity, according to the velocity of the wind.

A represents a horizontal shaft which works in suitable bearings, *a a*, upon a cap, B, said cap, working loosely upon a circular plate attached permanently to a proper support or frame work, D, figure 1.

The shaft, A, projects some distance beyond the edge of the cap, B, and has a wheel, E, figure 2, attached permanently to it.

F represents the wings or sails which are secured to spindles, *b*, said spindles passing radially through the rim of the wheel, E, and into its hub, the spindles being prevented from withdrawing by collars, *c*, which bear against the inner edge of the rim and bearings, *d*, figure 3, which are secured by screws over the spindles, the spindles being loose in the wheel, E, and allowed to turn upon their axes. Four wings or sails are represented, but any proper number may be used. G is a hub fitted loosely upon the shaft, A, and having projections, *e*, at its front end, to which projections small levers, *f*, are attached by pivots, *g*, the outer ends of the small levers, *f*, being secured to the ends of levers, *h*, by pivots, *i*. The levers, *h*, are secured permanently to the spindles, *b*, as shown in figure 2. The inner end of G has a groove, *j*, turned on it, in which groove a forked lever, H, fits, figure 1. The lever, H, is bent, and has its fulcrum at *k*, and to the outer end of it a wire or rod, I, is attached, said wire or rod passing down in a groove, *l*, in a vertical rod, J, the upper end of which is connected to a crank, K, on the inner end of the shaft, A, by a connecting rod, L. The lower end of the wire or rod, I, is attached to a sliding head or boss, M ; on the rod, J. *m* is a spring, one end of which is connected to a vertical portion of the bent lever, H, and the opposite end to a projection on the inner bearing, *a*, of the shaft, A. The sliding head or boss, M, on the rod, J, has a recess, *n*, in it, in which a fork at one end of a lever, O, fits, said lever having its fulcrum at *p*. The opposite end of the lever, O, is attached by a pivot to a piston rod, P, the piston of which works within a cylinder. R is a reservoir containing water, and S is a pipe which projects over the top of said reservoir, the opposite end of the pipe communicates with the outside cylinder, reservoir, R, and a pump, T, at their bottoms, as in dotted lines, figure 1. The rod, J, it will be seen, is the piston rod of the pump, T ; U is a cock in the pipe, S ; V is a horizontal wing attached to the cap, B, for the purpose of keeping the wings or sails F, facing the wind. In case the shaft, A, revolves too rapidly, the cock, U, is somewhat turned so as to check the free passage of water through the pipe, S, and the water will then be forced against the under side of the piston of the outside cylinder, and will raise it, and the head or boss, M, will consequently be moved down upon the rod, J, and the wire or rod, I, will draw downward the horizontal arm of the lever, H, while the vertical arm will force outward the head, G, on the shaft. A, arrow 2, and the levers, *f h*, will turn the spindles, *b*, and the wings or sails, F, move obliquely to the wind, and the motion of the mill will be decreased in a corresponding degree. When it is desired to increase the motion of the mill the cock, U, is opened, and the water having a free passage through the pipe, S, the head or boss, M, is raised upon the rod, J, and the head, G, on the shaft, A, brought back to its original position by the spring, *m*, the wings or sails presenting a greater surface to the wind. The spring, W, causes the lever, O, to resume its original position or depresses the piston in the outside cylinder, when the water has a free passage through the pipe, S.

In figure 1 the pump is represented as drawing water through the suction pipe, *t*, from a well, W, and forcing it through the air chamber into the reservoir. A crank being on the shaft, A, on the horizontal revolving head, and the rod, I, connected to this crank, a reciprocating motion is given to the piston of the pump, thus drawing and forcing out the water by single stroke alternately. With one valve opening inwards, and one outwards in the bed plate of the pump cylinder, it can work as a single-acting force pump, driving the water through the air chamber into the reservoir without any other connections or apparatus. This windmill is chiefly intended for farmers where a moderate power is required, and can be applied to various kinds of work, as well as pumping water. The claim is for "attaching the spindles, *b*, of the wings, F, to the sliding head, G, by the levers, *h f*, and operating said head by the lever, H, and a governor of any proper construction for the purpose of giving the desired obliquity to the wings or sails, thereby insuring an equal motion and power during the variable velocity of the wind." One of these machines is on exhibition at the New York State Fair, in this city.

More information may be obtained by letter addressed to Halladay, McCray, & Co., at Ellington, Conn.

A correspondent of the London *Builder* says that houses should be painted in the autumn ; wood-work painted in October, he says, looks better at the end of four years, than if painted in June it would at the end of two.

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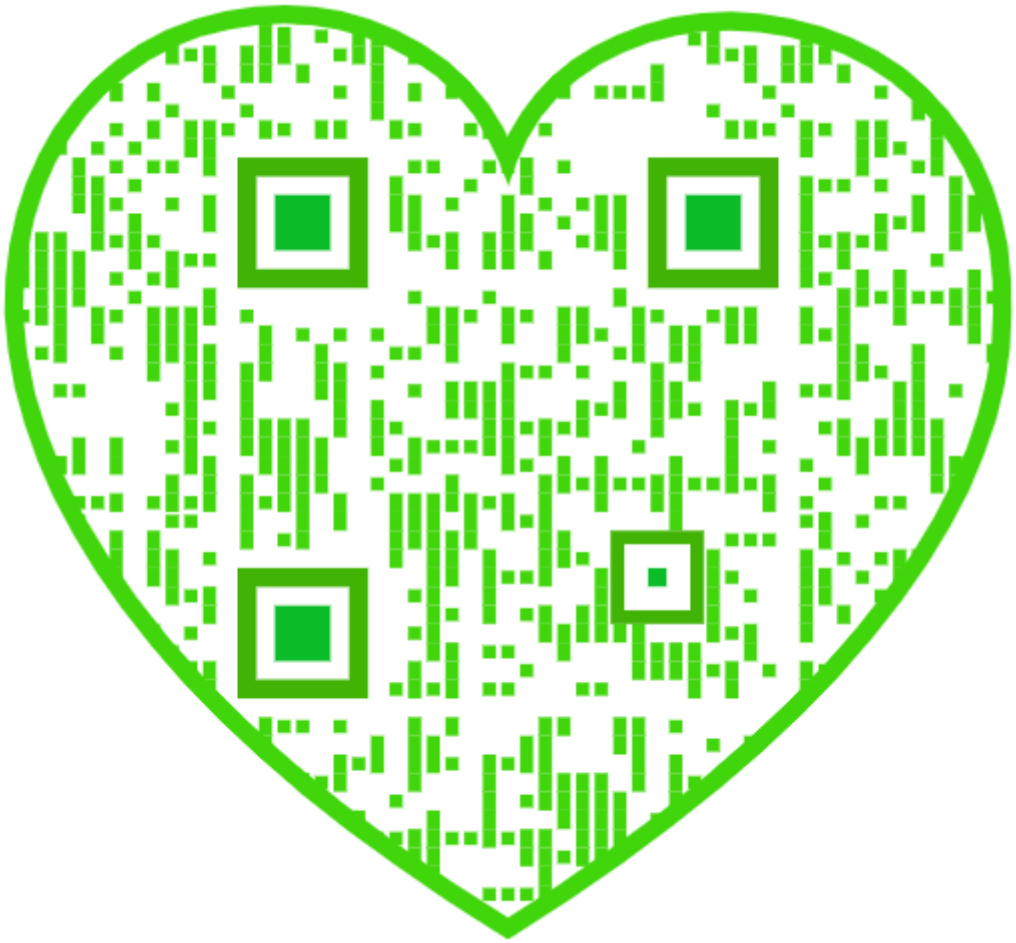


Great Railroad Speed.

THREE HUNDRED MILES PER HOUR.—A paper was lately read by Judge Meigs, before the American Institute Farmer's Club, at New York, upon the subject of rapid railroad traveling, in which he said :

"I have, with others, admired the progress made in velocity on railroads up to even *one hundred miles an hour on straight rails*, which has been done in England. But I entertain views of railroad velocity far beyond any yet ventured to be expressed. The Emperor of Russia has taken the first great step towards what I deem the ultimatum of railroad travel.

"Instead of cutting a narrow alley through the country, or going around everything in the way of a straight line—he has cut a broad way five hundred miles, from St. Petersburg to Moscow—he has made it all the way *two hundred feet* wide, so that the engineer sees everything that comes on the road!

"Such is part of the future; the railroad from point to point a mathematical line; the rails ten times stronger than any now used; the locomotives on wheels of far greater diameter, say twelve or fifteen feet; the gauge of a relative breadth; the signals and times perfectly settled; the road, walled on both sides, during the transit of trains having the gates of the walls all closed. Then, instead of *one hundred miles an hour!* we shall more safely travel *three hundred miles an hour!* I will not pretend to say more—one hundred seems fast enough; so did twenty, a few years ago; and now, on very straight rails or some straight runs, we do travel sixty miles an hour in this State, and in England, one hundred miles have been accomplished.

"Mathematical precision and time will solve this problem—a passage from New York to San Francisco in *ten hours!*"

[We have no doubt of one hundred miles per hour being a perfectly practicable railroad speed, by the building of such railroads as those described by the Judge, and this opinion we expressed in the columns of the SCIENTIFIC AMERICAN some years ago.—But three hundred miles per hour inclines us to the fogy side of the question. This speed would require a piston velocity of 3,300 feet per minute, of eighteen-inch stroke, if the driving wheels were twenty-four feet in circumference, (nearly eight feet in diameter—whoppers) and they would have to make 1100 revolutions per minute. As the wheels cannot turn round without steam, the query with us is, the means of raising the steam necessary to perform this feat, as the boiler would have to evaporate about a tun of water per minute—sixty in the hour. So far as it relates to the final velocity of steam in a vacuum, the speed of three hundred miles per hour could be obtained, but how can such a quantity of steam be evaporated in a locomotive boiler, in this space of time? Judge Meigs may perhaps be able to answer us. With respect to the velocity of bodies, our ideas are bounded by what has been performed before our eyes,—the flight of the swallow, the pigeon, the eagle; but when we look to the heavenly bodies and calculate the awful velocity with which they are unceasingly wheeled through space, the mind is struck with solemn awe at the mighty power of the great Creator, who has made huge Jupiter to revolve once on his axis in ten hours, and through space at the rate of 4685 miles per hour, or fifteen times the velocity of a locomotive running at the rate of 300 miles an hour.

Discoveries at Herculaneum.

The Paris papers state: "that excavations at Herculaneum have recently been continued, and have led to the discovery of two houses, facing the sea; but on the whole the results have not been satisfactory. At Pompeii the excavations, after being long suspended, have been renewed, and have brought to light a bronze statue of Apollo, of a size rather larger than life. They are to be continued with the view of discovering the walls of the town. At Canosa, (*Canusium*,) in Apulia, the excavations of Greek tombs have been continued. These tombsare in the form of small chambers, with columns and paintings, and are found to contain gold ornaments, consisting of collars, bracelets, diadems, ear-rings and rings, together with arms and vases. On the latter are designs of great beauty, representing on a black ground red figures of animals and birds, warriors, &c.—These vases are supposed by some persons to be Egyptian, by others Babylonian. At Capua excavations have led to the discovery of a tomb in the form of a chamber, with several paintings of women playing fifes, and other figures."

Franklin Institute Fair.

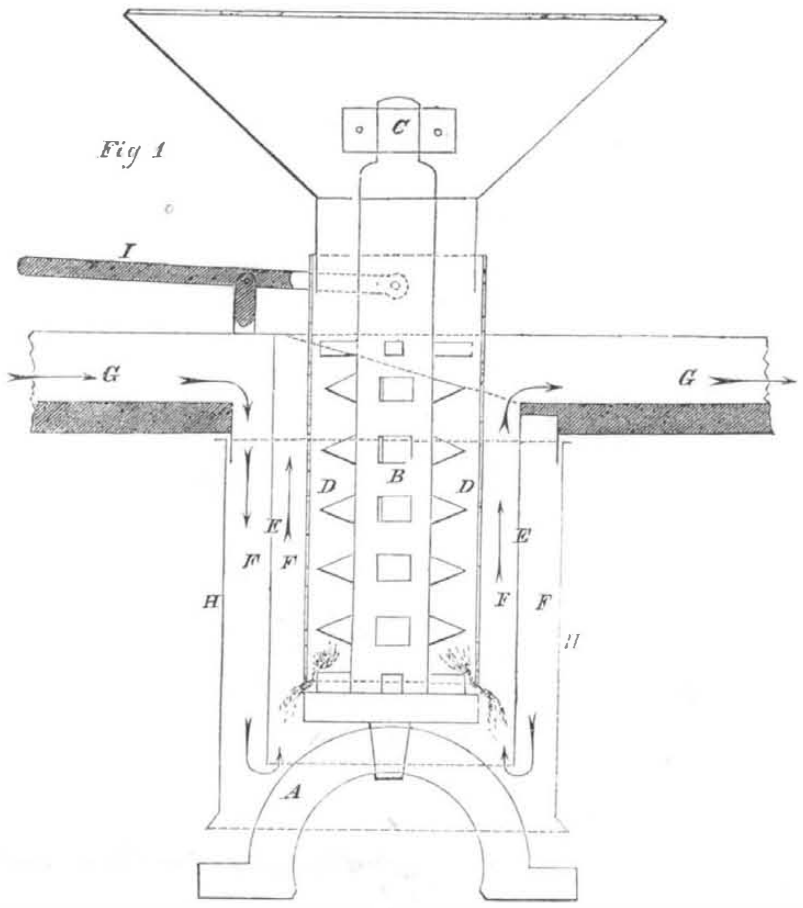
This old Institute intends to hold its regular Annual Exhibition of machinery and manufactures, in the city of Philadelphia, in the month of November.

The Pennsylvania State Fair.

By the *Ledger*, we learn that the Pennsylvania State Fair, held last week in the vicinity of Philadelphia, presented the astonishing spectacle of 100,000 persons in one day on the grounds.

CLEANING AND FEEDING GRAIN TO MILLSTONES.

Fig 1



This figure is a vertical section of an improvement for cleaaing and feeding grain to millstones, for which a patent was granted to Simeon Shearman, of Goshen, Indiana, on the first of August last. The apparatus is placed between the ordinary hopper and grinding stones.

A is the *bail* of the running stone; B is the damsel or shaft provided with spikes or projections for acting upon the grain to break smut balls, and rub off other impurities from the grain. The top of the shaft, B, runs in a bearing box, C, in the hopper. D is a fixed metallic cylinder surrounding the shaft. E is another cylinder outside of D, having an inclined top, and the spaces, F F F F, form air chambers, by which a current of air from a fan is driven, as shown by the arrows, G G, between the cylinders, D E H, and separates the lighter impurities from the grain, blowing them out of the machine. The outside cylinder, H, is made of tin, and placed in the running stone. J is a lever for raising or lowering cylinder D, to regulate the feeding of the grain to the stones.

This machine has been in practical operation at Goshen, Ind., for two years, and has worked satisfactorily. The blast keeps the spindle and grain cool; and the flour ground in the mill to which this apparatus is attached, Mr. Shearman assures us is not so liable to clog in the bolting cloths as in the usual way of grinding. He warrants it to be a correct and never-failing cleaner and feeding apparatus for flouring mills.

More information respecting patent rights, &c., may be obtained by letter addressed to the patentee.

Heat—What is it.

Some have supposed heat to be a subtle substance pervading all space, and in the discussions of the application of heat to hot-air which have appeared in some journals, the authors have dealt with heat as a grocer does with cheese—cut it up into slices; the great difference between the two being, that the grocer's slices were veritable, tangible realities, while the slices of hot air were merely hieroglyphics,—as substantial food for the mind as air is for the body. By some recent experiments of Regnault, in Paris, the old hypothesis of heat being a fluid, seems to be settled in the negative, and the phenomenon of heat, like sound, is attributed to a vibratory motion in bodies. In a recent lecture, he stated that if hot-air in a vessel like a glass globe, be allowed to expand into another empty vessel, kept in a water bath at the same temperature, that there would neither be an elevation nor depression of the temperature of the air, although it were allowed to expand to ten times its former bulk. But if that air be allowed to escape to do work, such as to move a turbine, or pump, the cooling increases according to the work done, "consequently we find," he says, "that the useful work done is more nearly expressed by the heat lost in the fall of temperature, in proportion as the machine is perfect." Those who have been saving fuel by throttling hot-air in regenerators, have been acting very unscientifically. This opinion of Regnault, which he has arrived at by direct experiment, was expressed on page 154 vol. 8, SCIENTIFIC AMERICAN, in explaining the nature of hot-air in an engine. The language we used was as follows: "the radiation of heat—what is called the *loss*—is the real value of the power given out by the machinery." This language was used with respect to a hot-air engine, which was to operate with the same air over and over again, like the one illustrated in the last number of the SCIENTIFIC AMERICAN. It affords us no small amount of pleasure to discover that the opinions of such an eminent chemist and philosopher as Regnault—arrived at by recent experiments—coincide with those we have expressed during the whole controversy relating to hot-air engines.

The Cincinnati *Gazette* of the 16th ult. says, at one time yesterday there was not a single steamboat at our landing, an event which has not occurred before for a number of years.

Gas from Wood.

In No. 2, this volume of the SCIENTIFIC AMERICAN, in an article on the manufacture of gas from wood, it was stated that W. P. McConnell had obtained a patent for making wood gas in December, 1851, and Lieut. Porter, U.S.N., one on the 22nd of August last, and that there had arisen "*some* controversy between the parties." Since then Lieut. Porter has called upon us, and has shown us a letter from the Commissioner of Patents, dated Aug. 15, 1853, in which it is stated that the only patent granted to Wm. P. McConnell was dated Nov. 4, 1851, and was for the manufacture of charcoal.

Under the signature of Dr. Page, formerly of the Patent Office, a long communication was published in the Washington *Sentinel* as an advertisement, wherein it was stated that W. P. McConnell had obtained a patent in December, 1851, for making gas from wood, and that which was patented by Lieut. Porter belonged to him. In our list of claims this week there is one to Mr. McC. for apparatus for making gas from wood, but certainly the statement by Dr. Page, as the attorney of McConnell, which was published in the *Sentinel*, relative to the patent of 1851, is not correct. Lieut. Porter asserts that he can manufacture wood gas cheaper than coal gas. We hope he can,—it is a question of economy.

Curious Fish.

MESSRS. EDITORS.—In a recent number of the SCIENTIFIC AMERICAN I noticed some remarks under the above heading, in which it was stated that James Robinson had shot two strange fish in the Connecticut River, describing their appearance, &c. Such fish are not uncommon in the Delaware River; we have caught hundreds of them this season, and many of them much larger than those taken in the Connecticut. We call them *Bill Fish* on account of their long snouts. When well cooked they are fine eating. Sometimes fifty of them will run into our baskets in one night They have been known in the Delaware only about five or six years, and have increased in numbers every year, so that they are now very abundant. J. H. B.

Stockton, N. J.

South Carolina Wool.

The Charleston *Mercury* says the experiment of rearing fine breeds of sheep for wool in the upper part of South Carolina, promises to be completely successful. Several gentlemen who have engaged in the trial have come to the conclusion that sheep flourish remarkably well throughout the State; that they can be raised at a trifling cost compared with that of the wool-growing regions of the North, and that the quality of the wool of the choice European breeds does not degenerate. Specimens of the wool have been rated by English manufacturers at the top of the market. The *Mercury* thinks that wool-growing, if properly followed up, will prove a source of wealth to the upper districts of the State.

Ohio and Indiana Railroad Convention.

A Convention of Superintendents and Presidents of the various Railways of Ohio and Indiana was held at Columbus, on the 22nd ult. Delegates from twenty-six roads were present. Resolutions were adopted entirely doing away with the free-pass system, and after the expiration of the current year, no pass, in any case, will be granted. The practice of passing clergymen at half fare, will cease at the close of the year. Resolutions looking to a gradual but general increase of the tariff of prices for freight and passage were agreed upon. The new regulations are to go into effect on the 1st of January next.

During a late thunder storm at Port Ontario, N. Y., as Keyes Fisher, son of the Postmaster of that place, was walking under the telegraph, a current of electricity passed from the wires to the top of his umbrella staff, and thence down his arms, doing him such serious injury that his recovery is doubtful.

A locomotive running at the rate of 250 miles per hour equals the velocity of a cannon ball.

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Practical Chemistry.

MUREXIDE AS A COLORING MATTER FOR WOOL.—The following article from the *Bulletin de la Societie Industrielle de Mulhouse*, will be read with great interest by all our chemists, and especially by our practical chemists, in woolen cloths, carpet, shawl, and de laine manufactories:

"The beautiful researches of Liebig and Wohler upon uric acid and its derivatives made us acquainted with a peculiar substance, to which they gave the name of alloxan. This body is obtained by adding very gradually 1 part of uric acid to 4 parts of nitric acid, of a specific gravity of from 1·45 to 1·5. The uric acid is dissolved with evolution of nitrogen and carbonic acid, accompanied by a considerable rise of temperature, which must be prevented as much as possible; on cooling, the mass becomes nearly solid, from the deposition of white granular crystals of alloxan. If these crystals be drained and dissolved in a very small quantity of water, and exposed to spontaneous evaporation in a moderately warm room, large, brilliant, colorless crystals, in the form of short right rhombic prisms, will be obtained. Alloxan is remarkable for the facility with which it undergoes changes when treated with different substances, and for the number of curious compounds thereby produced. Thus if sulphuretted hydrogen gas be passed through a solution of it, sulphur is precipitated and a new body formed, to which the name of alloxantine has been given; or if its solution be slightly acidulated and a slip of zinc placed in it, the same body will be produced under the influence of the nascent hydrogen evolved during the dissolution of the zinc. Alloxantine being sparingly soluble in cold water, readily separates in crystals, which may be obtained pure by solution in hot water, for, unlike alloxan, it is not decomposed by continued boiling. If 4 parts of alloxantine and 7 of alloxan be dissolved in 240 parts of boiling water, and 80 parts of carbonate of ammonia be added, a very peculiar body will be formed, which will crystalize on the liquor cooling. These crystals are of a beautiful garnet-red color by transmitted light, and have a beautiful iridescent green by reflected light. To this body the name murexide was given, from the Murex or shell-fish, from which it was supposed the Tyrian purple was formerly procured. Previous however to the experiments of Liebig and Wohler, Dr. Prout had described the same substance under the name of purpurate of ammonia, but obtained in a somewhat different way. So readily is this body formed, that a solution of alloxan will stain the skin purple in consequence of its production. This fact led its second discoverers to imagine that, like the Tyrian purple, it might be employed as a dye-stuff. The diffculty however of obtaining it, and of fixing it upon the fabric when formed, prevented for that time the idea from proving fertile.

Some time since, however, Dr. Sacc turned his attention to the subject, and led by the fact above mentioned, that a solution of alloxan stained the skin, came to the conclusion, that by impregnating a piece of woolen cloth with that substance, he might be able to produce the murexide directly in the tissue. He tried the experiment, and succeeded in dyeing a piece o cloth of an amaranthus tint, far more beautiful than that produced by cochineal. He communicated the results of his first experiments, still incomplete, to M. Albert Schlumberger, who has succeeded, by modifying and completing the experiments of Dr. Saac, in rendering the process, merely indicated by the latter, perfectly practicable.

His process is simple enough. He prepares a solution of alloxan, formed of 30 grms. of alloxan to each litre of water, and soaks the tissue to be dyed in it, the excess of liquid being then squeezed out in the ordinary way, or by pressure between rollers. The cloth is then dried at a gentle temperature, and after an ageing of twenty-four hours the color is brought out by passing the cloth over a roller heated to 212° F. For this purpose the drying machines composed of several drums would answer perfectly, the cloth being successively passed over each, the greatest care being taken to avoid folds; woolen yarn and wool should be put in a stove heated by steam. According as the heat is communicated to the cloth, a magnificent purple tint, far more beautiful than anything hitherto produced by the ammoniacal preparation of cochineal, or by red dye-woods, makes its appearance as if by magic. The intensity varies according to the strength of the solution of alloxan which has been employed. It is only necessary to wash the cloth in cold water to give to the shade its full brilliancy.

M. Sacc found that the finest and most vivid shades could only be communicated to the tissues mordanted with salts of peroxyd of tin, and M. Schlumberger has confirmed this observation. Cloth not mordanted did not give very satisfactory results, even after a prolonged exposure to warm and damp air. He obtained the most satisfactory results by soaking the cloth in a solution composed of equal parts of perchloride of tin and oxalic acid, of a specific gravity of 1·006. In this solution, at a temperature of about 100° F., the cloth is to be allowed to remain for an hour, then rinsed and dried, aad is then fit to be treated with alloxan. If stronger solutions of the mordant be employed, there is a considerable loss of coloring material, and a deterioration of the shade.—This may be attributed to the presence of too great an excess of stannic acid, which from its opacity may mask the murexide, or by its acid re-action may decompose it. This is especially the case if chloride of tin be employed instead of stannate of soda. Experience has shown that fabrics freshly mordanted give better results than those which have been mordanted for some time; the depreciation in purity and brilliancy of tint in the latter may even amount to 20 or 30 per cent.

Murexide, as we have already remarked, being produced by the action of heat and ammonia, it occurred to M. Daniel Dollfus, and the other members of the committee for the chemical arts, appointed by the Societe Industrielle of Mulhouse, to report upon the memoirs of M. Schlumberger, to try the effect of exposing a piece of cloth, treated with alloxan, to the vapors of ammonia. The result confirmed their anticipations, for the color was immediately produced without the necessity of ageing the cloth after its impregnation with the alloxan.—There can therefore be no doubt that the best results will be obtained in future by the employment of ammoniacal vapors, for, besides the saving of time, there will also be a saving of alloxan. This substance is very liable to decompose, especially in the presence of even minute traces of reducing agents, such as protochloride of tin or sulphurous acid; traces of the latter substance always remain in the cloth after the operation of bleaching, no matter how well washed it may be, and would be quite suf ficient to prevent the formation of the murex ide.

As yet all the attempts that have been made to communicate the murexide-purple to cotton or silk have failed, that substance having an affinity apparrently only for wool, to which it gives a very permanent and durable dye. Sunlight, so destructive to other purples, appears to have but little action upon that of the murexide; a piece of cloth dyed of a rose color had its tint scarcely altered by evposure to the full action of the strongest sunshine during two days, and the color was only fully discharged by an exposure of more than two months.—Boiling water and steam completely destroy the color produced upon cloth mordanted with salts of tin; the decoloration commences in boiling water at a temperature of about 158° F., and augments with the iucrease of temperature.—This destruction of the dye is caused by the action of the mordant, for cloth dyed without the use of a mordant not only supports to a certain extent the action of boiling water, but even acquires a uniform, and perhaps a more beautiful and deeper tint than that given by prepared woolen fabrics. Further experience may show that hot water and the application of ammonia alone may be advantageouly substituted for the mordanting and the passage over heated cylinders.

[To be concluded next week.]

The Odometer.

Measures have been taken by Julius Thompson, of Middleboro, Mass., to secure a patent for an improvement in odometers, which consists in the peculiar means employed for communicating motion from the wheel of the vehicle, to which it is attached. The working parts of the instrument have a cylindrical weight placed within the case, which gives motion to the machinery as the wheel revolves.

An odometer is an instrument secured to the axle of the wheel of a carriage, and is actuated by the revolutions of the wheel, and indicate the same, just like the "tell tale" of a steam engine. Thus, if we knew the circumference of the wheel of the carriage, we can easily tell the space over which it has passed, if we know the number of revol utions it has made. A wheel of 16 feet in circumference, is required to make 330 revolutions in going one mile, (5280÷16=330) or 2640 revolutions in one hour, when running at the rate of eight miles per 60 minutes.

The odometer is a well known instrument; various modfications of it have been presented. The above named invention is designed as an improvement over those which have been heretofore employed.

Vermont Gold—Spirit of the Age.

The Editor of the *Spirit of the Age*, Woodstock, Vt., feels very indignant because we have had the presumption to disbelieve the genuineness of the gold discoveries in Vermont,—the "offence hath this extent and no more;" and by way of showing how very warmly he feels upon the subject, he states that the SCIENTIFIC AMERICAN is notorious in his vicinity "for being down on all projects in which it has not received a retainer in some form." Now that we are discovered by this Woodstock *Spirit*, it is no more than fair in us to give our readers the benefit of it.

This information will be very useful to those who have honored us with their confidence heretofore, and will serve as a warning to all future applicants. Our respected Senior comes in for a personal compliment, and is charged with persisting "in a falsehood of his own starting." We are thus let into the secret which stimulates the editor in his zeal to make the public believe in the Vermont Gold Story.

"It will never do to give it up so Mr. Brown," a little stock in a gold mine is no mean affair, providing it can be *negotiated* before the dividend period arrives.

The public can no longer question the story since this astute editor endorses it so thoroughly. It is "a weak invention of the enemy" to entertain any doubt whatever, and other journals who attempt to throw cold water on the scheme are to be demolished, as we have been, at a single blow by this Ajax of the *Age*. He considerately thinks, however, that the interest of the mines will not be affected "if it does not happen to suit the pleasure of the SCIENTIFIC AMERICAN to state the truth in relation to them." Now we beg to inform our bellicose cotemporary that it suits the pleasure of the SCIENTIFIC AMERICAN to have a gold mine wherever one can be found, and we have not the slightest objection to one or a dozen in Vermont. Gold is the *Spirit of the Age*, and no doubt Mr. Brown's eyes are yellow with its magical reflection. We hope his glowing anticipations may not sink beneath the surface of despair, for however rich and inexhaustible are the stores of imagination, there are fits of returning consciousness when the mind seizes again upon the stern and naked realities of facts. Calm yourself, Mr. Brown, time will dispel the annoying spooks which hover over your perturbed spirit.

Steamboat Boiler Explosion.

Some friend has sent us in an envelope from St. Louis, the testimony of witnesses in the trial of C. W. McCord, and J. R. Scott, engineers of the steamboat *Timour*, No. 2, which exploded her boilers near Jefferson, on the Missouri River, on the 2nd of last Aug., by which twenty persons lost their lives. These engineers have just been tried before B. F. Hickman, U. S. Commissioner for the Missouri District, on the charge of manslaughter, misconduct, and inattention to their duties as engineers, and have been acquitted of these charges.

In this case the *Timour* exploded her boilers while lying at the wharf, and not when moving off as has generally happened with steamboats, and on that account attributed to "surcharged steam." Forming an exception to the generality of steamboat explosions, it has created no small amount of discussion among engineers, and as a consequence, there is a great diversity of opinion respecting the cause of the explosion. At the time the unfortunate event took place the doctor or supply engine was in operation, there was plenty of water in the boilers, and steam was blowing off; that is, according to the testimony. Under such circumstances there is scarcely an engineer living who would not give in his opinion that an explosion would be impossible. W. C. Chappell, assistant engineer, who was on board at the the time of the explosion, gives it as his opinion that it was caused by some sudden and unaccountable rapid generation of steam. Saml. Gaty, an engineer, also a witness, expresses his belief in "such a thing as an instantaneous accumulation of steam," and that the *Timour's* boilers exploded from this cause.

On the other hand, Davis Embree, Supervising Inspector of steamboats, gives it as his opinion that the iron of the boiler had become crystalline in its texture from incrustations, and thereby had deteriorated in strength, and was riven to pieces by the pressure of steam. There is one fact connected with the explosion which would show that the boiler was pretty strong if the pressure were high, viz.: the great distance to which some of the pieces were thrown—200 feet high and 160 yards horizontally.

One thing is terribly clear, and this requires sympathy for engineers in their dangerous profession—the boilers gave no alarm; the explosion was instantaneous and the engineers had not the least suspicion of such a catastrophe being at hand. The only way that we can conceive of the instantaneous generation of a great quantity of steam is by the exhaustion of all the air from the water, and an elevation of its temperature to nearly 300°. In such a case water will explode like gunpowder, and this appears to have been the case with the boilers of the *Timour*. More light, however, may yet be thrown upon this peculiar case.

Beavers.

The beavers which inhabit the northern parts of Europe, are said to be essentially the same as those which establish their republican dwellings along the course of our North American streams. In an article which appears in the North British *Review* it is stated that these interesting animals still exist in some abundance in certain sections of Sweden and Norway. The number of the tribe has diminished so much latterly, that its members are now rigorously protected by law, for a considerable term of years. The great requirements of the beaver, are a thinly peopled country, with abundance of wood and water. In the American and Arctic regions their northern extension seems to be restricted solely by the deficiency of wood, and they are known to have occurred as far south as the parallel of 30 degrees—or almost to the Gulf of Mexico. "The flesh of the animal is greatly prized by hunters and voyagers, especially when roasted in the skin after the hair is singed off. This of course is an expensive luxury and is frowned at by the fur traders."

The demand for beaver skins has decreased within a few years, owing to the different materials which are now used in the manufacture of hats. In 1808, no fewer than 126,927 beaver skins were exported to England from Quebec alone.

Pheasants, partridges, quail, and prairie hens are said to be very abundant this fall in Western New York. A Rochester paper says—"Squirrels have multiplied and thrive in uncommon quantities. Pigeons crowd the woods, and game in its various sorts is easily procured."

It affords us sincere gratification to hear of the decrease of yellow fever in our Southern Cities, and of cholera in Pittsburg, Pa.

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New Inventions.

Sawing Machine.

The vast timber interests of our country is evidenced by the great and universal attention which has been devoted to timber cutting machines of every description. To the many various improvements in sawing machinery which have already been made, Pinney Youngs, of Milwaukie, Wis., has added another, for which he has taken measures to obtain a patent. It relates to sawing boards direct from the log, and consists in the use of two pairs of saw guides, attached to vibrating levers—one pair at each end—in such a manner that the guides may be brought in contact with the saw (a circular one) at either end. When one pair of guides are brought in contact with the sides of the saw, the guides at the opposite ends of the levers will be thrown out from the saw at the period when the carriage has moved to the end of its way and receives its return motion, whereby it is enabled to cut both ways—during both the forward and back motion of the carriage. He has also applied a combination of devices for setting the log correctly and quickly.

Planing and Jointing Shingles.

Sawed shingles are far less durable than those which are made with a smooth surface, therefore, although it might be an easier and a more rapid method of producing shingles to saw them out with circular saws, the superiority of the planed or shaved shingle naturally directs attention to the best way of making them by machinery. In order to produce the best quality of shingles, John J. Speed, Jr., and John A. Bailey, of Detroit, Mich., have made an improvement for planing and jointing them, for which they have taken the proper measures to secure a patent. It consists of two reciprocating frames, provided with cutters and a feeding bar, which gives an accelerated motion to the shingles, while passing between the cutters. One set of cutters plane the face and others the sides of the shingles, which are first reduced to rough shingles from blocks, in any proper riving machine, and then submitted to the planing action in the improved machine.—The planing of shingles is not a new thing, the present machinery is only claimed to be an improvement over plans in use.

Improved Wash Stand.

Articles of furniture are objects of no small concern to every good housewife. They should all be conveniently adapted to their specific offices, and when they can be made ornamental as well as convenient, taste as well as convenience is gratified. For an improvement in portable wash-stands, W. A. Miller, of Brandenburg, Ky., has taken measures to obtain a patent; the improvement consisting of dividing it into several parts, one of which shall contain a water vessel to supply clean water by a faucet, and to drain off the dirty water, when required. The other parts are arranged for the basin, &c., and all made very ornamental, and adapted, when not in use, to form a neat and convenient table.

Blind Slot Machine.

G. C. Sweet, and G. W. Noyes, of Norwich, Conn., have applied for a patent for an improved machine for cutting tenons on blind slats. There are two cutter heads on this machine, which are placed on a suitable frame and made to operate in such a manner, that they approach one another by means of a treddle and bent levers connected to them by rods, and act upon the slat presented to them, cutting off the surplus parts and leaving perfect tenons formed on the ends of the slat. The cutters rotate, and both ends of a single slat are trimmed at one operation, which is exceedingly simple and effective.

Safety Pinions.

J. G. Shands, of St. Louis, Mo., has taken measures to secure a patent for an improvement in safety pinions, which consists in securing vertically to the pinion shaft, two or more elliptic springs passing between the spokes of the pinion, which turns loose upon its shaft, in such a manner that, as the shaft revolves, the springs carry the pinion with them, and tend to preserve the machinery from breakage, if the shaft were suddenly checked or stopped.

Railroad Tickets not Property.

Judge Robinson, of Rochester, N. Y., has decided in the case of the State versus Andrew Donnelly, on a charge of larceny for stealing sixty Central Railroad tickets, that such tickets, not in the hands of *bona fide* purchasers, were of no intrinsic value, and hence not the subject of larceny.

LOCKING PRINTERS' FORMS.

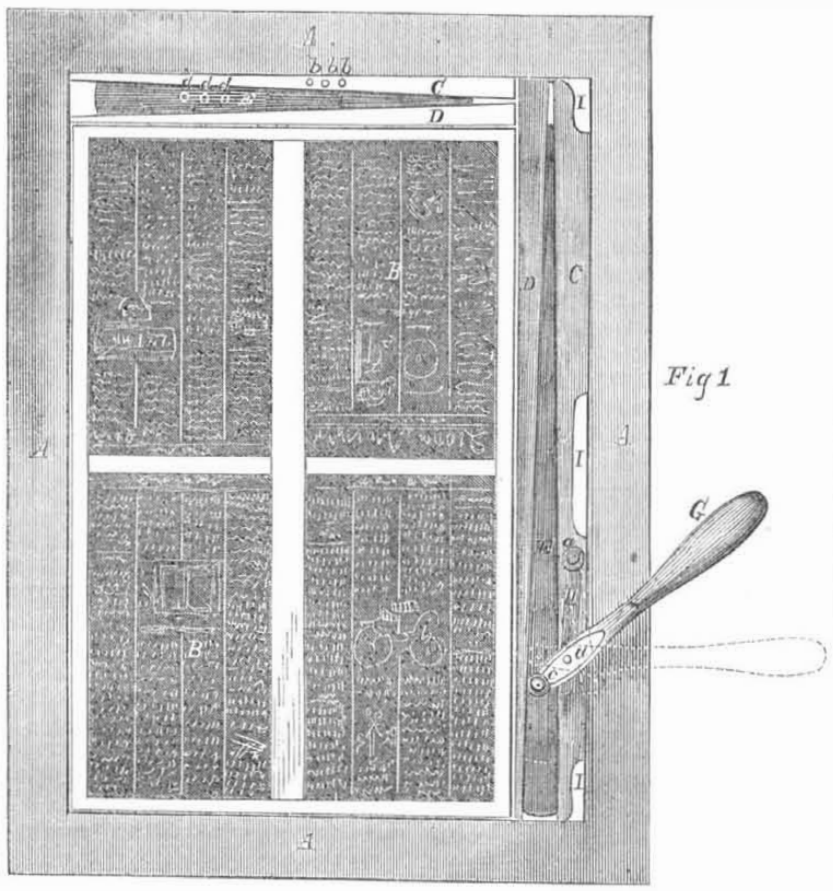
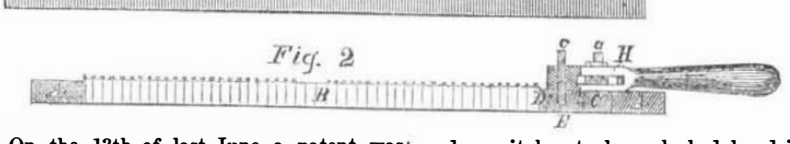
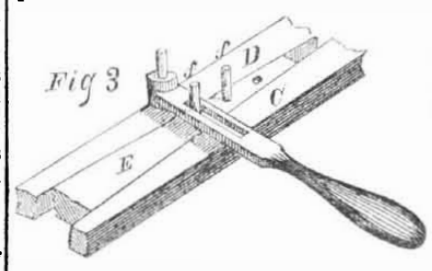


Fig 1



On the 13th of last June a patent was granted to E. H. Sprague, of Zanesville, Ohio, for an improvement in Locking up Printers' Forms, represented in the accompanying engravings, figure 1 being a plan of a *chase*, showing a "form" locked up in the same, according to the improvement; figure 2 is a vertical transverse section or edge view of the same, and figure 3 is a broken perspective view of the improved lock with the key modified. The same letters refer to like parts.



After a printer composes his type, it is transferred to a metal frame named a chase, represented by A. It has division strips in it for the retention of a number of columns and pages of type, B B, according to the nature of the work to be printed. When the type is made up in the chase ready for printing, it is named the form, and is then transferred to the bed of the printing press. To prepare it for the printing operation, however, the type must be well secured in the chase to allow of the form being easily handled, and the paper printed in the press, without disturbing the type. For this purpose a set of loose furniture is used which consists of slips of wood or metal of different dimensions, some of which are placed at the top of pages, others between the pages, and others in the form of wedges to the bottoms and sides of the pages. When all the pages of a form are properly placed, they are driven close together by small wooden wedges named "quoins," between the slanting side of the foot and side sticks. This is the ordinary process of imposing or locking up a form of type. To make corrections in type, after the form is made up, it has to be unlocked by driving back the wedges, with mallet and driver, which is a troublesome operation, like that of driving up the quoins to lock the type. To expedite and facilitate the imposing, the locking and unlocking of the type, Mr. Sprague employs tapering tapering bars which are operated by a lever, and are arranged along the side and end of the chase their whole length.

A A A A represent the chase; B the type; C D the stationary tapering bars, each of which have one of their sides parallel—the parallel side of C, lying against the chase, and the parallel side of D, against the type; E represents the sliding wedge lying between said bars. These wedges serve for tightening or locking the type in the chase—they causing the bar to exert pressure in a straight line upon the type.

G H is the compound lever or key for bringing the wedge into action, or forcing it tightly between the bars. It is provided with a movable fulcrum, *a'*, and the part, H, has a pin, *a*, to turn upon; this pin is secured fast into, and fits loosely in either of the holes, *b*, in the bar, C, when in use. The main part, G, of the lever, is also provided with a pin, *c*, which fits in either of the holes, *d*, in the wedge, E; the holes, *b*, are placed in such relation to those, *d*, that when the pin of the part, H, and the pin of the lever, G, are inserted in them, as shown in figure 1, and the lever pulled to the position shown in dotted lines, the wedge will be forced tight between the bars, C D, and thereby exert a powerful pressure upon the type, which pressure will cause them to be firmly held in the chase. When the lever has been moved to the position shown in dotted lines, and it is found that the form is not locked up sufficiently tight, its pins must be removed to other holes; after this, the lever must be again moved to the right, with sufficient force to press the wedge still further between the bars, and so on until the form is perfectly locked up. It should be understood that the wedge remains securely in its place after once being forced home, and only can be removed by applying the key or lever, and forcing it to the position shown in black, from that shown in dotted lines; I I I are openings in the bar, D, for the fingers to pass through in handling the form after it has been "locked up."

A similar arrangement as that described, is employed for the foot lock, the key or lever which is used for the side lock, being employed for forcing the wedge of the foot lock, between the tapering bars of the same.—The wedge might be forced between the bars by means of a lever similar to that shown in figure 3, by securing pins, *f f*, fast in the wedge, E, and forming an oblong slot in the lever for either of said pins to play in as the lever is moved to the right or left. The operation of this lever will be evident.

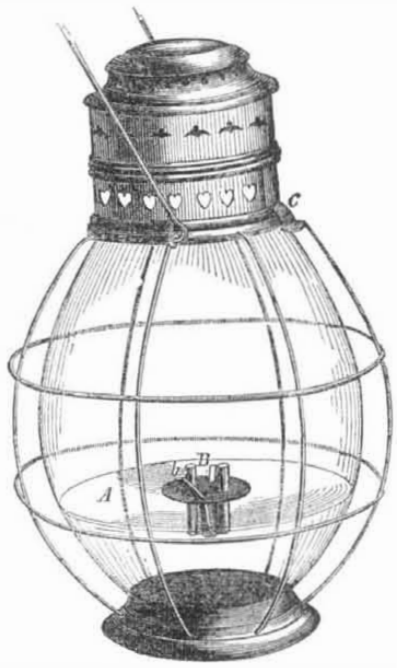
From the foregoing description it will be seen that the intermediate wedge, E, by its gradual taper and great length of surface exposed to friction will have little or no tendency to shift or loosen after the lock has been established, also that by its working between the two tapering bars, C and D, a direct or straight and equally distributed pressure is thrown upon the entire form in locking the same, and this most expeditiously and easily by the single operation of the hand lever.

It will at once be noticed by all practical printers that the long wedge, E, is here substituted for the common quoins, and that it is operated by lever purchase, instead of mallet and driver. The improvement for small forms at least, appears to be a very good one indeed.

More information may be obtained by letter addressed to the inventor.

Glass Lanterns.

This figure represents an improvement in lanterns, for which a patent was granted to Philemon A. Morley, No. 34 Fulton street, Brooklyn, on the 29th of August last. The nature of the invention consists in making the lamps and lantern of glass, and in one piece. The lamp and lantern are shown provided with the ordinary hinged top, handle, protecting guards, and metal base. The air is admitted through the top in the usual manner, and the lamp filled and trimmed by taking off the cap, C. The oil reservoir, A, is made in one piece with the glass globe, the two being made separate and then blown together. B *b* are the tubes and wick plate. No fastening is employed to secure the lamp to the lantern, and as the oil reservoir is transparent this lantern gives out more light than the common kind. There is no liability of the oil being spilled or wasted in filling the lamps, for in case it should run over the reservoir in filling, the surplus oil will be safely held in the lantern until the quantity in the oil chamber is lessened by burning, when it will run in to maintain the supply. We have been assured that this lantern can be made at a less cost than those made with separate lamps; its utility is evident. It is simple of construction and easily understood.



For more information address the patentee as above.

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Scientific American.

NEW YORK, OCTOBER 7, 1854.

Management of Railroads.

The railroad system of this country, with its thousands of miles of iron arteries, through which flows the life blood of our inland commerce, affords, at the present period, matter for deep reflection. The immense importance to the community of a judicious system of railroads, can scarcely be exaggerated. The value of a railroad, not only to the cities and villages which are connected with it, but to the districts through which it passes, cannot be over-estimated. It opens up new branches of industry on every hand, and real estate, previously of little value, by the facility of communication, is at once made productive by the cheap access to market for the disposal of its produce. The rapid development of the latent resources of our country by the introduction of railroads, is a marvel in its history; the annals of political economy furnish no such examples in the rise and progress of solid national wealth and power. It has been said, and that truly, that no other country on the globe is so well adapted for the building of railroads as ours, and no other requires them so much. With its extensive and fertile plains, separated by elevations of a low altitude, the cost of the construction of our railroads now in operation has been nominally small in comparison with those in Great Britain and on the continent of Europe. With a wide-spread industrious population, mostly devoted to agriculture, raising so much for exportation, and filled with a passion for travel beyond that of any other people, it is reasonable to suppose that our railroads, with but very common-place management, should stand high in the credit of the money market, and pay their way with respectable dividends. And at the present moment this we reasonably would expect, when we consider how much prosperity our country has been favored with during the past two years, and as a consequence, a great increase in railroad freights and passengers. But instead of our railroads standing out as spectacles of prosperity and good management, they appear before the world as objects of suspicion—bankrupt in character and confidence. There are some honorable exceptions to this sweeping declaration, but their number is small. It is a well-known fact that the stocks of many railroads which sold one year ago at premiums of from ten to twenty per cent., have depreciated to the same extent below par. There must be a cause for this state of things. The fact is plain, that these railroads make no adequate return for the money expended in their construction, furnishings, and management; but where lies the fault, and what is the remedy? These questions are easier asked than answered, for there are various ways of mismanaging any enterprise, and every specific evil requires a specific remedy.

One great cause of the present railroad embarrassments is attributable to the general apathy exhibited by stockholders in the election of Directors, the majority of them being in the habit of giving their proxy votes to the first applicants, as if it were of no consequence to them who should be chosen. The success or failure of any railroad depends entirely upon those who are chosen to manage its affairs—its Directors. And can it be expected that an inefficient or profligate set of men, employed in any capacity, will fulfill their trusts with honor, honesty, or ability? Let the New York and New Haven Railroad answer. There are too many men in the community and in high stations, who are just as honest, and no more so, than the times will admit, consequently no stockholders nor Directors of a railroad are entitled to an excuse for negligence and want of discretion in looking after their own interests and the affairs committed to their management. The affairs of many of our railroads have been, and are now badly conducted; there is a great necessity for some sweeping reforms, and the exercise of a scrupulous vigilance. The Superintendent of a railroad is the most important personage connected with it in its working capacity, and it is a notorious fact that a number of railroads which, under one superintendence, were quite successful, have become failures under other superintendence. A superintendent should be a thorough practical man, possessed of indomitable energy, decision, skill, sagacity, and honesty, so that he may be able to work the road to the best advantage. It is a well known fact that on many of our railroads there are swarms of useless officials—hangers on—the relatives of the Directors, whose whole merits consist in consuming the extra earnings of the company. There is great necessity for a pruning reform in this respect. Great care should be exercised in the choice of engineers, conductors, machinists, &c., they should be chosen for their good qualities, but this is not always the case—favor and patronage, not worth, being the appointing qualifications on some railroads.

Runners and *dead-heads*, (free passengers) have been great clogs on the management of our railroads. On the New York and Erie Railroad last year, the free passes equalled a sum of $160,000. On other roads the amount of dead-headism was no doubt proportionally large. At the recent Railroad Convention held in this city, it was resolved to cut off the free list,—a resolution which meets with our entire approbation; off with their heads. Many suppose that those connected with the Press are naturally "dead-heads," and that when they travel they do so free of charge, and are hailed everywhere. This is a mistaken idea; there are very few dead-heads belonging to the City Press; its members generally prefer, like us, to be scolding-free, and pay their way, asking no favors.

The bad character which our railroads sustain at home and abroad at the present time, is humiliating to us as a people, as there can be no doubt but the want of sagacity to manage well, or the want of honesty to manage just, is the cause of this. A more rigid railroad economy, a scrupulous honesty in every officer, and in every department, will yet retrieve their character. The late Schuyler frauds perpetrated under the very noses of the Wall street ogres, have opened the eyes of the community to the corruptions and evils of our railroad system; a better spirit is now abroad, and for the future there is Hope.

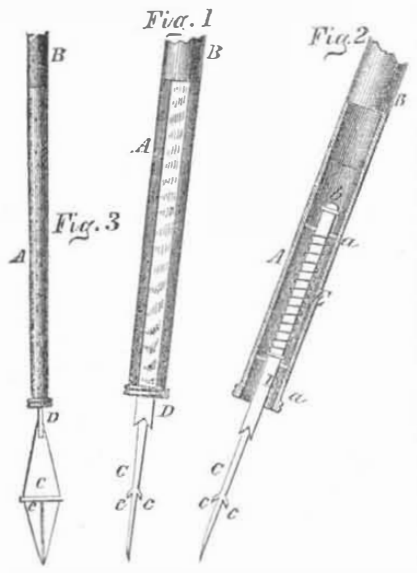
The French Exhibition Again.

In our last number we announced our intention to establish an agency in Paris, for the supervision of articles intended for the French Exhibition. Since that time, Governor Seymour has appointed one of the Editors of the Scientific American, Commissioner for the State of New York, to attend the Exhibition, and to take charge of all articles sent from this State.

It should be borne in mind that the regulations are such as to render it necessary that foreign Exhibitors should be represented by the Commissioners appointed by their governments. These Commissioners will correspond directly with the Imperial Commission, which will not hold any correspondence whatever with the Exhibitors themselves, or with private persons, either French or foreigners. The lists of Exhibitors who are admitted must be sent to the Imperial Commission by the 30th of November, 1854, at the latest. Therefore, it is very important that all citizens of the State of New York who desire to exhibit should signify their intention to us immediately, in order that we may make suitable arrangement for space in the Palais de L'Industrie. The articles intended for exhibition should be specified and the dimensions given. The Exhibition will open on the 1st of May next, and close on the 31st of October following. The agricultural and manufacturing products, as well as the works of art, of all nations, will be received. Exhibitors will not be subjected to payments of any kind, either for entrance, or space, or on any other pretext whatever, during the whole time of the exhibition. With respect to foreign goods admitted to the exhibition, the Exhibition Palace will be constituted a bonded warehouse; and at the close of the exhibition the goods may be sold in France on the owners paying the duties. Provision is also made for protecting the rights of inventors who have not yet secured a patent.

Indeed, the arrangements and regulations appear to be admirable, and we do not doubt but that they will be strictly carried out.

Patent Pen.



The annexed engravings are views of an improvement in metallic pens, for which a patent was granted to W. R. Glover, of Glasgow, Ky., on the first of August last. Figure 1 is a side view of the pen attached to the holder. Fig. 2 is a vertical section of the same; and fig. 3 is a back view of the pen. Similar letters refer to like parts. The invention consists in attaching lips, *c c*, to the pen, to prevent the ink from ascending and soiling the fingers of the penman. A is the socket, and B the common holding case; C is the pen, the upper end of which is secured to the shank, D, around which is placed a spiral spring, E. The shank and spiral spring fit in the socket, A, the springs being confined between two plates, *a a*, of the socket; *b* is a small nut on the end of shank D; this retains the shank in place. *c c* are two lips placed tranversely about the middle of the pen C—one is on the back and the other on the front side of the pen, and their object has already been explained, viz: preventing the ink soiling the fingers. The spring to which the shank of the pen is connected, is to give it greater elasticity, and therefore greater freedom to the writer. The claim is for the protecting lips, *c c*.

More information may be obtained by letter addressed to the patentee.

The New York Crystal Palace.

It is now intended to extend the time of keeping the above establishment open, and not close it, as was purposed, in the early part of this month. During the summer the price of admission was twenty-five cents; it has been raised to the old price—fifty cents. The number of visitors to it now is not large, and this, with the removal of many articles, gives it a very dull and empty appearance in comparison with that which it displayed in the month of September last year.

The machinery is still kept running, and has considerable attraction for visitors who have been there for the first time. We have not been able to discover the addition of but two new machines, to fill up the gaps left by the removal of a great many old ones. One is a rotary knitting machine, by T. Bailey, of Ballston Spa, N. Y., which knits stockings in a continual tube, which is cut in sections of the lengths desired, and the feet part sewed up, thus forming stockings of any length. The machine itself might be carried about in a gentleman's hat, and all the work the operator has to do, is simply to turn a crank handle. For making canvas tubing, which could be made water-tight by paint, we consider it to be a capital invention. The other new machine which we noticed, is one for steering vessels by steam power; but as it was merely in the course of being fitted up, and not in operation, we could form no proper idea of its merits or mode of operation. The steam power is intended to be applied by two small inverted cylinders set opposite to each other at an angle of 45°. The Crystal Palace, although shorn of much of its former splendor and attractions is still a place worth visiting. Those who have not yet visited it, may never have the opportunity of seeing the like again.

Wholesale Copying.

The New York *Dutchman* claims, in its prospectus, "unsurpassed originality," "abundant pecuniary resources," and asks its exchanges "for an occasional notice and due credit for whatever may be taken from its columns." This "originality," we suppose, consists in copying, as it did into its issue of the 23rd of September, eleven distinct articles from one number of the Scientific American, without any credit whatever.

If its "abundant pecuniary resources" partake of the same character, we may soon expect to be called upon to "stand and deliver."

This wholesale *thugging* upon a cotemporary is a very little business, and we presume the editor of the *Dutchman* will not at least insist that "due credit" should be given to his journal for that which does not belong to it by any fair interpretation of honesty.

We believe no other paper has ever perpetrated so *large* a *courtesy* upon a single number of our paper.

We copy the following expressive paragraph from the *Dutchman*, of Sept. 30th:

"The *Sunday Mercury* copied some of our crumbs last week, without credit. The week before the *Home Journal* did the same. This is wrong and should be reformed."

Letters Patent.

We have a large stock of letters patent on hand, sent to us for the purpose of having engravings prepared and published in the Scientific American. Patentees who have had their wants attended to in this respect, will oblige us very much by ordering their patents to be returned to them. We have been compelled to purchase an extra fire-proof safe for the protection of these valuable documents—and as it is now filled, we must seek some relief for new applicants. Oblige us, friends, and order your patents away, and if there is any balance due us, do not forget to remit it with the order.

The State Fair.

The New York Annual State Fair, open this week from Tuesday, is held in Hamilton Square, which is about four miles from the City Hall. The Third Avenue and Harlem cars run past the entrance of the enclosed grounds, and the Second Avenue cars within one block of them. It is very easy for strangers to get to the Fair by taking any of these cars. The grounds are well laid out, and about $8,000 is to be awarded in prizes. Manufactured articles and machinery will receive considerable attention. Eighteen acres have been enclosed for use, and arrangements on a very extensive scale have been made for exhibitors and visitors.

The famous Barnum has charge of the live animals, and horses, hogs, and hens make a distinguished appearance.

$570 IN PRIZES.

The Publishers of the Scientific American offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

$100 will be given for the largest list,
$75 for the 2nd, $35 for the 8th,
$65 for the 3rd, $30 for the 9th,
$55 for the 4th, $25 for the 10th,
$50 for the 5th, $20 for the 11th,
$45 for the 6th, $15 for the 12th,
$40 for the 7th, $10 for the 13th,
and $5 for the 14th

The cash will be paid to the order of each successful competitor; and the name, residence, and number of subscribers sent by each will be published in the Scientific American, in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.

☞ See new Prospectus on the last page.

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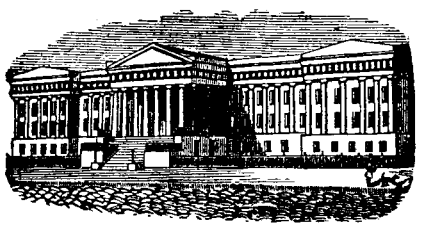

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 26, 1854.

GAS GENERATORS—N. Aubin, of Albany, N. Y.: I claim the combination of the gas generating retort, with the diaphragm steam generating retort, charged with porous earth, pieces of brick, pumice stone, or some other porous substance, as described, for the purposes set forth.

FIRE ARMS—Fordyce Beals, of New Haven, Ct.: I claim the rotating the chambered breech or cylinder by means of a double ratchet producing rotations by both forward and backward movement of trigger lever acting on the side surface of the large diameter of the cylinder, as described, using for the purpose pawls and ratchets, or any other similar contrivances for producing the same effect.

ELASTIC GOODS—Edward Brown, of Rindge, N. H.: I claim the described elastic fabric, the india rubber being confined between two thicknesses of stocking work, for the purpose set forth.

NECK YOKE—Schuyler Briggs and J.G. Talbot, of Sloansville, N. Y. We claim making two or more sections of a screw on each of the rods which carry the end rings in combination with the nuts in the bar of the yoke, so that it may be used with one end short and the other long, or both ends either long or short, as may be necessary or desirable, as described.

HOT AIR FURNACE—Gardner Chilson, of Boston, Mass.: I claim the arrangement and employment, with respect to a fire pot or chamber, as described, of one or more cones or tapering tubes, without descending bends or flexures, and having their eduction opening or openings made to carry off the non-combustible volatile products, and to retain nearly if not all the volatile combustible products, while the external surface or surfaces of such tube or tubes are exposed to freely radiate heat, as described, the same serving to generate a large amount of heat and securing a great economy in the consumption of fuel.

And in combination with one or more such tapering tubes made to communicate with the fire chamber, as specified, I claim a conical or tapering radiator closed at top, and arranged directly over the fire, and made to open near its base in the said tapering tube or tubes, and to operate with respect to them and the fire pot or chamber, and the surrounding air or medium to be warmed or heated, as specified.

I also claim combining with the upper part of the fire pot or the rim over the fire pot, and with the exterior cones or tapering radiators, the conical or partially conical bases, or semi cones attached to and making part of the rim, the same serving not only to facilitate the entrance of smoke and heat into the conical radiators, but the absorption of heat and its radiation towards the floor, as specified, and the reflection of heat into the tapering radiators.

I also claim the arranging the feed or fire-place door within the trunk or mouth-piece to the fire pot or place, so as to operate as specified; and in combination with the mouth-piece and the door arranged in it, as specified, I claim the passage in the mouth-piece and its plate, for the thin sheet or stratum of air to pass under the door, while it is wholly closed, and said plate, and can be heated by contact with the plate before it (the said air) reaches the fuel.

And in combination with the inclined door of the fire-place. the plate, and the air passage directly under it, I claim the ledge or flange, arranged as described, the same being not only for the purpose of regulating the admission of air into the passage, but of keeping it from passing under the door and over the plate, while the ledge is below the level of the top surface of the plate.

I also claim the arrangement of the register hole, viz., in line of, or axially with respect to the shaft of the grate, in combination with the arrangement of the outer end of said shaft, viz., entirely within the throat of the ash pit, or in rear of the registry plate or opening, as specified; the said arrangement not only enabling me to dispose of the grate shaft entirely within the ash pit mouth (the end of said shaft when projecting from the front face of the furnace being generally speaking more or less in the way, besides presenting an appearance often disagreeable to the eye,) but to make the registry opening answer the purpose not only of admitting air to the fire when required, but of enabling a person to place a key or crank upon the shaft, for the purpose of turning or moving the grate when necessary, and this without danger of ashes escaping out of the ash pit, provided its door be closed.

CLASPS FOR LOOM HARNESS—George Copeland, of Danville, Me.: I claim the clasp formed of two plates having holes to receive the strap and catches or teeth, or other analogous projections to catch the harness shaft or rail, as described.

KNITTING MACHINES—J. A. Corwin, of Newark, N. J.: I claim, first, the tool on which the loops are formed and interwoven, consisting of two pieces terminating in hooks or barbs, or other equivalent thereto, and so combined that when motion is given to said pieces one of the hooks shall seize the loop last deposited, and retain it while the other shall take up and cast off the loop of the previous course, whereby the two become intertwined and a netted fabric formed, as set forth.

Second, I claim the flange, or any equivalent, for making a recess or groove upon the sides of the plate or shank of the horn, whereby a space is made for the point of the take-up hook to pass behind and seize the loop, as described; the whole being as described.

PARREL AND BOW—John Dame, of Portsmouth, N. H.: I make no claim for the lining of my parrel with wood, leather, or composition inside.

But I claim the construction, arrangement, and combination of the said upper and lower semi-bands with the side pieces or supporters, together with the parrel bow, to which the yard is secured, as set forth.

BEDSTEAD FASTENINGS—John Drayton, of Buffalo, N.Y.: I claim the manner of fastening the end rails to the posts by means of the curved or crooked tenons in combination with the clamp and wedge for securing the side rails to the posts, as described.

ELECTRIC CLOCKS—Alexander Hall of Loydsville, Ohio: I claim, first, giving motion to the clock movement and to the pendulum by means of a beam and spring, said beam carrying and deriving its motion from the armatures of two electro-magnets through which electric circuits are alternately closed and broken. and transmitting motion to the clock movement by means of clicks and ratchets or their equivalents, and to the pendulum, by means of the spring, which serves to maintain its isochronous vibration without regard to the strength of the current, and thereby make the clock keep perfect time, and serve to regulate a number of electric clocks, as described.

Second, the manner of closing and breaking the circuit of the battery, so as to make it pass through one and the other of the electro-magnets alternately, by means of wedge-shaped points of silver or other metal, which are caused to vibrate by the movements of the pendulum, and pass between small posts of suitable metal attached to permanent magnets or other conductors, which form parts of the separate circuits through the two electro-magnets, as described.

Third, securing the connections which close the separate circuits, when they are made by means of two pieces of soft iron, which vibrate in connection with the wedge-shaped pieces, or other equivalent means of closing the circuit, and are brought, when the circuit is closed, into contact, or nearly into contact with permanent magnets, as set forth.

[See engravings of this clock on pages 233 and 236, Vol. 9, Sci. Am.]

RAILROAD CAR SEATS—Wm. Graham, of Philadelphia, Pa., and Lawrence McLaren: We claim the levers, in combination with the leg rests and the movable seat, constructed and arranged as described.

CHAIR FRAMES—Moses E. Halsey, of New York City: I claim the construction of the back of a chair, in the manner described, that is to say, combining with each post and with the back rail of the seat, a supplementary post sustained and braced as set forth.

MACHINES FOR ADDING NUMBERS—Aaron L. Hatfield, of Lewisburgh, Pa.: I claim the slotted reckoning lever with the spring ratchet attached, the disk with its sunken teeth, the curved disk, C, with the slots cut in the curve, the outer disk and lining, B, with springs, the disk, E, with its sunken teeth, cam, and steady pins, the whole being arranged and combined as set forth.

WHIFFLETREES—Thomas Hardman and Albert Vose, of Pittsfield, Vt.: We claim the use of the iron fastening in the gain or slot, by means of a slide or catch, as described.

MACHINE FOR PAGING BOOKS—Henry Hockstrasser, of Philadelphia, Pa.: I claim the adjustable escapement, and the roller, in connection with the spaces, as described.

PLATFORM SCALES—J. F. Keeler, of Cleveland, Ohio: I claim, first, the raising or lowering of the platform or platform scales, simultaneously at all points, without regard to the position of the weight upon the platform, the weighing levers being retained in their proper places for weighing, and preserved from swaying about while the raising and lowering is being done, by the intermediate platform or frame, as described.

Second, the combination of the spring balance with the platform scales arranged as described and for the purpose set forth.

SAFETY LAMP—Chas. R. Landmann, of New York City: I claim the use of the pendulum or swinging shaft, in combination with the balance rod, having a re-acting spring in connection therewith, and camphene or other explosive fluid lamp, as set forth.

MACHINERY FOR FELTING HATS OR HAT BODIES—John B. Laville, of Paris, France. Patented in France Aug. 20, 1852: I claim arranging the two series of rollers mounted in separate frames held or pressed together, as described, but this only I claim when the two series of rollers have a continuous rotary motion and a longitudinal reciprocating motion, the two series moving in opposite directions, as specified.

And I also claim, in combination with the two series of rollers for felting hats, the mode of supplying hot water to the two surfaces of the hats as they are passed through the machine, as described, and declare that in the description the words hat bodies include every description of hats made from any matters capable of being felted.

CONNECTING A SERIES OF CAR BRAKES—Paul Moody, of Camden, N. J.: I claim the arrangement of bent levers at each end of every car, having their longitudinal arms projecting beyond the ends of each car, in such a manner that when the cars are coupled together, the faces of each opposing arm shall come into contact, and without any fastenings, form a continuous mechanism for operating the brakes throughout a train, as described.

RUNNING GEAR OF LOCOMOTIVE ENGINES—Septimus Norris, of Philadelphia, Pa.: I claim, in a locomotive engine not having more than one pair of flanged driving wheels, the combination with the driving wheels of one or more pairs of flanged guide wheels, to keep or aid in keeping the engine upon the rails when the driving and guide wheels are so arranged that while running upon a straight rail the former shall carry the load and the latter act as guides.

SPRINGS TO THE KNIVES OF STRAW CUTTERS—Joseph B. Stockton, of Warren Co., Ky.: I claim the construction and arrangement of the adjustable double spring guide, the moving and the fixed cutters whereby the moving knife is held up to its work, whether the resistance opposed to it be at the middle or at either end.

HARVESTERS OF GRAIN AND GRASS—J. J. Weeks, of Oyster Bay, N. Y.: I do not claim, separately, having the sickle teeth working through two fingers, for this has been previously done.

I claim the track clearer, constructed in the form of a spiral or screw, and arranged and operating as described.

Second, I claim having each tooth of the sickle work through two of the fingers, in combination with the beveling of the cutting edges of every alternate tooth, so that while one tooth shall have its cutting edges on its upper face, that next to it shall have its cutting edges on its lower face, as shown.

WASHING MACHINES—Moses D. Wells, of Morgantown, Va., I claim the construction of the rubber with a flange at the bottom, as set forth.

WASHING MACHINES—Joel Wisner, of Aurora, N. Y.: I do not claim the employment of a single spindle passing through the disk and operating lever.

But I claim the compound spindle composed of the socket and spindle, constructed, arranged, and operating as set forth, for diminishing the amplitude of the vertical movement required in lifting in and removing the rubber and preventing the binding incident to the said operations when a single spindle is used.

MACHINE FOR CUTTING IRREGULAR FORMS—Arad Aldrich of Princeton, Mass., (assignor to John L. Cooper, of Worcester, Mass., and Arad Aldrich, aforesaid.): I do not claim the use of revolving cutters as such.

But, first, I claim the making an expansible cutter, consisting of two or more parts revolving upon the same plane, yet capable of separation in the line of their axis, in the manner and for the purposes described.

Second, I claim the combination of the cutters and governing apparatus, when said governing apparatus consists or is formed by slides or surfaces corresponding to the outline of the form required, taken from two or more sections at right angles with each other as set forth.

UNITING BATS FOR MAKING SEAMLESS FELT GARMENTS—D. W. Gitchell, of Rahway, N. J., (assignor to John C. Wagstaff, of New York, N. Y.): I claim as an improvement in the process of making felt garments, the use of glue or other equivalent connecting substances, as specified, as a means of holding together the surfaces until they can be thoroughly united by the felting process, as described.

PROCESS FOR MAKING ILLUMINATING GAS FROM WOOD—Wm. P. McConnell, of Washington, D. C.: I claim the improvement herein described in making gas from wood, viz: subjecting the products of destructive distillation therefrom, to a high degree of heat, in the manner and for the purpose set forth.

RE-ISSUE.

APPLYING WATER TO COMPOUND BUCKETS OF FLUTTER WHEELS—David Rankin, of Augusta Co., Va. Originally Patented July 11, 1854: I claim the so arranging of cunl-form buckets upon the radial arms of flutter wheels as that in passing through an eccentrically formed water way three buckets shall receive the volune of water in about the proportions herein described and represented.

The Patent Office.

Workmen are now engaged in laying a flag pavement at the Patent Office building. The east wing is to be enclosed with a handsome iron railing, set in granite coping, a part of which is already in place. Trees (the silver-leafed maple) are likewise to adorn the premises. Mr. John Reese is there busily employed in laying pipe, in order that the exterior of the building may be illuminated with gas, instead of fish oil, which has for some months past cast a sickly glare around that beautifully constructed edifice. The improvements are under the superintendence of the Commissioner of Public Buildings.—[Washington Sentinel.

Patent Cases.

PLANING MACHINES.—Circuit Court of the United States for the Northern District of New York.—John Gibson agt. Wm. W. Cook, and John Gibson agt. Wm. W. Cook, James C. Finch et. al.—These two important cases were argued by the late Mr. Stevens, in behalf of the defendants, and Mr. Samuel Blatchford for the complainant, before Judges Nelson and Hall at the last October Circuit. The bills in both cases were filed for damages for using Woodworth's Planing Machine, and an injunction had been issued against the defendants. An order has just been entered dismissing the bill in both suits and dissolving the injunction.—[Albany Express, 20th September.

[The above is so vague that we cannot well understand it. It says an injunction *had* been issued, and again "an order has been entered dismissing the suits and dissolving the injunction." This requires some explanation. There must have been an application made to remove the injunction prior to Judge Nelson issuing an order to dissolve it.

An Iron Coffer Dam.

In a report of the proceedings of a semi-annual meeting of the Cornwall Railway Co., in England, embracing the report of Mr. Brunnel, the Engineer, on the works of the Saltash Bridge, on a part of the line of unfinished railway between Truro and St. Anstell, we find a description of a coffer-dam of a novel construction, sunk in a verp deep part of the river, to facilitate the construction of a pier for the support of the center of the bridge which forms a necessary part of the line. The dam in question is not only of a novel structure, but it is made to shut out water to a greater depth than any other work for a similar purpose that we have before seen any account of, viz., a pressure, under high tides, of 70 to 80 feet. It is so constructed as to act on the principle of the diving bell, in case the water should find its way into the inclosure. But it seems to have thus far served its purpose, without a resort to this apparatus. The structure is thus described:

"It consists of an iron cylinder 37 feet in diameter and 85 in hight, containing, within itself all the arrangements of air chambers, passages, &c., necessary for using it either as a large diving bell or simply as a coffer dam, as circumstances might require, and so constructed as to be afterwards divided into two parts vertically, and removed after the pier shall have been built within it. The whole, weighing upwards of three hundred tuns, was safely launched and floated into place, where it was raised perpendicularly, and pitched upon its lower edge in the center of the river. The river is at this point upwards of 50 feet deep at low water of neap tides, and, except for a short space on the turn of the tide, there is a considerable current; under such circumstances, this cylinder, drawing 50 feet of water, was pitched upon its lower edge accurately—that is, within three or four inches of the exact point required, Since then the work has been carried on at the bottom of the cylinder, as in a diving bell, against a pressure of water occasionally of 70 and 80 feet. The mud and other deposits, forming the bed of the river for 10 feet or 12 feet in thickness, have been removed, and the cylinder is now resting on the rock, and preparations are making for excavating the rock into level beds for receiving the masonry.

The railway of which the branch now under construction, and nearly in readiness to receive the rails, forms a part, is an extension of the line of Great Western, the Bristol and Exeter, and the South Devon Railways, throughout a great part of the county of Cornwall to near the Lands End.

Puzzling Questions.

MESSRS. EDITORS—I wish you or some of your readers would tell us what it is that makes substances elastic. For instance, steel. When it is bent, why do not its particles separate and break like glass? Or india rubber, when it is pulled, why does it contract again; and also timber that is elastic? Some substances will bend, and with a little force to keep them bent for a little while, will remain so, while others will spring back again. Perhaps you will say, it is the attraction of cohesion. But what *is* the power called the attraction of cohesion? Is it electricity? If so, and if all substances are charged with it, why are not all alike elastic? Is it because some are more highly charged than others, having in nature a stronger affinity for electricity—such as some of the metals?

Again, why is steel made hard by heating and then immersing in water? What does the sudden cooling in tempering do to make it hard when slow cooling, and especially shut off from the air, makes it soft? Is it simply by bringing the particles of the steel in closer contact? If so, how does the sudden cooling do this?

The facts we all know, but the why and the wherefore all do not know. There are many facts of every day occurrence that but very few can understand and comprehend. These questions may not be of that kind. T. S. J.

North Ridgeville, Ohio, 1854.

[It is very true, as our correspondent remarks, there are many facts of every day occurrence which few can understand and comprehend. It would be very easy to put a simple question to the wisest and most learned man in the world, which, with all his learning, he never could answer. All that we know of what are called "natural laws" is simply the operations of matter. Thus we say all bodies possess gravity, but that is merely a name for the operation of bodies, with respect to their influence upon one another: we do not know what gravity is. The very plan which is employed to harden or temper steel, by heating it to a red heat and then dipping it in water, is the same that is employed to soften copper; and the plan which is employed to malleableize or soften iron, by heating and then cooling slowly, is the very method which is employed to temper or harden copper. It may be said that fibrous materials are tough, while crystalline materials are brittle, but that is no explanation, for why this should be, no one can tell. We believe that when we have arrived at a knowledge of all the operations of matter and their phases, we can proceed no further in scientific investigation; the *why* in natural science we never can comprehend.

The Tea Trade and its Frauds.

A gentleman in China, writing to his brother in Boston, gives some curious facts in relation to the manufacture of tea from old leaves that have been once used, and the making up of entire boxes filled with foreign substances. He says:—

"There are so many opportunities, as the tea passes through various hands, and so many ways of cheating and deceiving, that the merchant must constantly be on the alert, or he will discover, after the tea has reached its destined market, that his cargo was made up of quite a variety; as, for instance, the introduction of boxes of spurious tea, that has been adulterated with an inferior quality, or (what is a curious kind of adulteration for tea), with stones, bricks, old ropes, and various kinds of rubbish.

New Material for Bottles.

The enormous quantities of Scoria cast aside daily from the blast furnaces of the iron works of the South Wales coal-field are, it appears, about to be turned to good account by the ingenuity of Dr. Smith, of Philadelphia. This gentleman, with a staff of assistant chemists, has for some time been staying at Merthyr, with a view of experimenting upon the blast furnace scoria, with the object of producing therefrom a variety of articles in daily use, such as square tiles, paving flags, bottles, and utensils of domestic use. In converting the furnace cinder, Dr. Smith has been very successful. The bottles thus made are much tougher, and the annealment more perfect than in the common glass ones, from which, in their appearance the new bottles cannot be distinguished.—[Ledger.

Bank of England Notes.

The notes of the Bank of England, under a new process, not long since adopted, are signed by machinery. The engraving of the whole note is complete. Formerly the Bank employed twenty clerks, at a salary each of £500 per annum, who did nothing else but sign their names to notes. The new mode of signing, it is supposed, will prevent counterfeiting.

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TO CORRESPONDENTS.

B. D. S., of Va.—To receive the commendation of an old subscriber like yourself encourages us very much. We shall continue to "expose error in high places," this is a part of our duty as journalists. We think the key possesses novelty—it is new to us.

Thos. Painter, Wheeling, Va.—Wishes to know where he can procure the best hand machine for boring out hubs for boxes.

A. E. B., of S. C.—We are frequently asked if iron buildings are safe in thunder storms. It is not generally known that they are the safest of all buildings under such circumstances.

T. B., of Tenn.—The size which you must use for your plank wall on which to dust sand, is boiled oil containing a little red lead.

A. H. V., of Montreal—We do not know where Mr. Pease resides. Malt vinegar is made by exposing beer in a very thin stratum over a very extensive surface. It is therefore made to percolate over fine wood shavings, from one large wooden vat to another in a room at a temperature of about seventy degrees. You would require to visit an estalishment in order to see the process before you proceeded to conduct it.

J. B., of N. Y.—Send us a sketch of your brick machine and we will advise in regard to its novelty.

J. P., of Iowa—The model of your bedstead, which you sent us two years since, we have destroyed. We do not undertake to keep models over three months, as we have no space for their storage so long.

A. O. W., of Tenn.—The end of the stick should be turned with a chisel, the lathe we think not capable of doing it. We have charged you with four subscriptions, $8, on account, leaving a balance of $42 your due.

J. O. A., of Mo.—We do not find anything new in your locomotive axle, and think there is no chance to secure it by letters patent.

H. B., of Ohio—It is generally conceded by all well advised attorneys that patents can be reached on execution for debt. The patent bill lately reported in the Senate provides against this.

C.S., of Mass.—You have a right to stamp a machine "patented," after the patent has expired, provided the date of the patent is also given, any one could see from the date that it had expired and was public property. The workman is not responsible. The difference on the volumes and numbers will be $1,50.

G. M., Jr., of Ill.—Your method of ventilating millstones to prevent them from heating, is not altogether new to us, and we think it doubtful about your being able to secure it by patent. Similar plans are in use on portable mills in this section.

J. G., of N. Y.—Wishes to know if any of our readers can inform him where such an instrument as a thermostal. ventilating thermometer, or self-adjusting ventilator can be procured. The object in view is the maintenance of a hot-house, conservatory, or room of a dwelling house at a uniform temperature. Inquiries among stove makers, professed ventilators of buildings, and gardeners have failed to procure any information on the subject.

James S. Edsler, of Leonardtown, Md.—Wishes information in regard to a practical machine for cutting ditches.—There is a demand for a good machine for this purpose.

A. W., of Mich.—There is nothing in your eccentric rotary engine which presents any patentable features. It is an old idea.

D. S., of N. Y.—It is not new to construct a sausage filler with a piston operated by a rack and pinion. We have seen the same thing. Thank you for the fine list of subscribers.

Money received on account of Patent Office business for the week ending Saturday, Sept. 30:—

R. P. B., of N. Y., $60; J. F. L., of N. Y., $25; E. D., Jr., of Vt., $57; E. V., of O., $30; Y. & S., of Wis., $35; H. B., of N. Y., $30; B. & W., of Mich., $20; G. H. M., of N. Y., $55; H. & A., of N. Y., $30; C & G.. of Ct., $25; C. W. W., of N. Y., $20; R. K., of Mass., $250; J. D., of Pa., $30; J. C. H., of Wis., $25; G. C., of Ind., $30; C. J. G., of N. Y., $80; S. H., of N. J., $50; S. P. S., of N. Y., $42; J. F., of Pa., $80; G. T., of N. Y., $25; S. M. & J. S., of N. Y., $20; M. C. M., of D. C., $30; G. T., of N. J., $27; G. S., of L. I., $32; S. P., of N. J., $7; W. W., of N. Y., $26; F. B. H. & Co., of Ind., $20; G. W., of N., Y., $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 30:—

G. W., of N. Y.; W. H. E., of N. Y.; W. W., of N. Y.; J. F. L., of N. Y.; H. & A., of N. Y.; C. & G., of Ct.; S. P. P., of N. J.; W. W., of N. Y.; G. H. M., of N. Y.; G. T., of N. Y.; G. T., of N. J.; S. H., of N. J.; G. S., of L. I.; S. P. S., of N. Y.; B. P. H., of Ind.; E. P. G., of N. Y.

Important Items.

PATENT LAWS, AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12½ cents per copy.

BINDING—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75. Subscribers who have missed numbers on the Volume just closed, can be supplied with copies to fill the vacancy, excepting the following numbers: 1, 6, 9, 11, 22, and 23.

RECEIPTS—When money is paid at the office for subscriptions a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

Terms of Advertising.

4 lines, for each insertion,	$1,00
8 " " "	2,00
12 " " "	3,00
16 " " "	4,00

Advertisements exceeding 16 lines cannot be admitted, neither can engravings be inserted in the advertising columns at any price.

☞ All advertisements must be paid for before inserting.

THE PACIFIC IRON WORKS—Bridgeport, Ct., manufacture to order high and low pressure steam engines; also boilers of every required size. They have on hand, and in process of manufacture, high pressure steam engines and boilers, from four to fifty horse power, which can be delivered in a few days after the receipt of orders. They also manufacture the following description of Machinists' Tools, viz.:—Planing Machines to plane 20 inches by 4 feet long. up to 6 feet square by 36 feet long: Turning and Engine Lathes, with 16 to 120 inches swing over the ways; Boring Drills; Slotting, Bolt-Cutting, and Drilling Machines; Boiler Shop Tools: Foundry Cranes; also, Rolling Powder, Sugar, Corn, and Flouring Mills; Pulleys, Shafting, and Gearing of every description. The buildings are large and commodius, having just been built and arranged expressly for an extensive and expeditious prosecution of the Foundry and Machine Business in all its branches. The Company have spared no expense in fitting up to produce the best Tools and Machinery in the country; and they feel confident in saying that any work intrusted to them shall be done in a manner equal, if not superior, to that of any similar establishment. Particular attention paid to the fitting up and manufacture of newly invented Machinery and Tools. A. P. HOUSTON, President, Bridgeport, Ct. 4 3m

A SPOKE MACHINE NOT TO BE EXCELLED. Great improvements have been made by one of the inventors, in Jenkins' & Knight's Patent Spoke Machine—and the machine is now incontestably far superior to any other spoke machine ever invented, as well in the rapidity of its execution as in the perfection of its work. Such improvements being now entirely completed, the proprietors are prepared to sell State, Town, and County rights at reasonable prices. A machine may be seen in full operation at Kingston, Ulster Co., N. Y., and one is now at the Maryland Institute Fair at Baltimore. Applications for machine, rights or information may be addressed to WHITING WEEKS, Agent of the Proprietors, Kingston, Ulster Co.. N. Y. 4 2*

CARRIAGE MAKERS and Patent Dealers who will address me, prepaid, will receive information of my improved carriage top, patented June 20, 1854, and will not regret their trouble. S. T. HUNTINGTON, Patentee, Syracuse, N. Y. 4 2*

THE TRUMBULL IRON WORKS—located in the town of Stonington, Conn., manufacture a superior article in the way of Machinists' Tools—they particularly call the attention of those in want of Planing Machines and Gear Cutters, offering a guarantee the same cannot be excelled in any establishment in this country. All articles delivered at the Company's Docks or Railroad Depot, free of expense. 4 tf

STEAM EMGINES AND BOILERS FOR SALE.—One new eight-horse engine. One second hand five-horse engine. Tubular boilers, second-hand, suitable for same. One second-hand two horse portable engine and boiler. THOS. PROSSER & SON, 28 Platt street, 4tf

WOODWORTH'S PATENT Planing, Tonguing Grooving Machines—Double machines plane both sides, tongue, and groove at one and the same time, saving one half of the time when lumber is required to be planed on both sides. Large assortment constantly on hand. Warranted to give entire satisfaction to purchasers. JOHN H. LESTER, 4 6* 57 Pearl st., Brooklyn, L. I.

ESTABLISHED IN 1796—Philosophical, Mathematical, and Optical Instruments. Our priced and illustrated Catalogue furnished on application, and sent by mail free of charge. McALLISTER & BROTHER, Opticians, 48 Chesnut st., Philadelphia. 3 6*

MACHINIST'S TOOLS—Now finished, two Engine Lathes, 9½ feet bed, 18 inches swing; one do. with screw cutting apparatus; also, one 7½ feet bed, 18 inch swing; and two do. with screw, from new and improved patterns and of superior workmanship, by C. S. TOLMAN & CO., Fitchburg, Mass. 3 6eow*

ENGINEERS, DRAUGHTSMEN, AND MECHANICS supplied with Drawing Instruments, separate and in cases. Parallel Rules, Scales, Dividers, Metallic Tape Measures. Linen do., Chains, Surveyors' Compasses, Levels and Transits, and a large assortment of Optical and Mathematical Instruments, wholesale and retail by JAS. W. QUEEN, of the late firm of McAllister & Co., 264 Chesnut st., Philadelphia. Illustrated catalogues gratis by mail. 3 3m*

CHEAP ENOUGH—Stearns & Co.'s Mammoth Catalogue of Books and Prints will be sent gratis, and pre-paid, to all who may apply for it before the 1st of January, 1855. Send along your names and those of your friends, gentlemen. Address STEARNS & CO., 163 Fulton st., N. Y. 3 2

THE SCIENTIFIC STAIR' BUILDER by Robert Riddell; atlas quarto. Illustrated with forty plates Price $5—This is a work that should be in the hands of every architect builder, and mechanic. The author having stripped the subject of all mystery and unnecessary lines, so that an ordinary workman can accomplish with ease and certainty, the most difficult and intricate description of stairs. It embraces the greatest amount of useful and original matter that has ever been published on this branch of art for which the author's well established reputation is a sufficient guarantee. The utmost care has been taken to arrange the practical diagrams, in order that they may meet the wants of those who have little or no experience in this art, and to furnish the most simple and comprehensive methods of attaining the object in view. Stone-cutters, masons, and all connected with building, are interested in this valuable book. John E. Carver, Architect, 51 Sixth street, Philadelphia, is the principal agent for the United States. All orders must be accompanied with the money. Single copies $5. The work may also be had at all the principal book stores in the large cities of the United States. 2 4

NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 1 tf

PATENT DRIERS—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

CHEAPEST AND BEST—The New York Weekly Sun is to be sent to subscribers after Oct. 1st, at 75 cents a year, ($1 pays for 16 months,) three copies for $2, or 25 copies for $15. and $100 cash premiums is to be divided among those who send in the most subscribers between Sept. 15th and Feb. 3rd, 1855. Specimen copies gratis. Address, (post-paid,) MOSES S. BEACH, Sun Office, New York. 1 tf

STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 1 tf

UNITED STATES PATENT OFFICE,
Washington. August 18, 1854.

ON THE PETITION of Solomon Andrews, of Perth Amboy, New Jersey, praying for the extension of a patent granted to him on the 5th of December, 1840, for an improvement in the "manner of constructing padlocks for mail bags and other uses, called the clam-shell padlock," for seven years from the expiration of said patent, which takes place on the 5th day of December, 1854:

It is ordered that the said petition be heard at the Patent Office on Monday, the 13th of November next, at 12 o'clock M., and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days from the day of hearing. All testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application.

The testimony in the case will be closed on the 3d of November; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered. also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Penn.; Scientific American, New York; and Post, Boston, Mass., once a week, for three successive weeks previous to the 13th day of November next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 2 3

UNITED STATES PATENT OFFICE,
Washington, Sept. 6, 1854.

ON THE PETITION of Henry Burden, of Troy, New York, praying for the extension of a patent granted to them on the 10th day of December, 1840, for an improvement in "machine for rolling puddle balls or other masses of iron, in the manufacture of iron, for seven years from the expiration of said patent, which takes place on the 10th day of December, 1854.

It is ordered that the said petition be heard at the Patent Office, on Monday, the 27th of November next, at 12 o'clock. M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 17th of November; depositions and other papers relied on as testimony, must be in the office on or before the morning of that day, the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.: Evening Argus, Philadelphia, Pa.: Scientific American, New York, and Post, Boston, Massachusetts, once a week for three successive weeks previous to the 27th day of November next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 3 3

UNITED STATES PATENT OFFICE,
Washington, September 19, 1854.

ON THE PETITION of Aaron D. Crane, of Newark, New Jersey, praying for the extension of a patent granted to him on the 10th February, 1841, ante-dated 22d December, 1840, for an improvement in "the method of constructing clocks," for seven years from the expiration of said patent, which takes place on the 22nd day of December, 1854—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 4th of December next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 24th of Dec.: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also. that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York, and Post, Boston, Massachusetts, once a week for three successive weeks previous to the 4th day of Dec. next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 4 3

RENSSELEAR POLYTECHNIC INSTITUTE—Designed for the education of Architects and Civil Engineers, including Railway, Hydraulic, Topographical, and Mining Engineers. For copies of the Annual Register, giving full information respecting the Institute, apply to B. FRANKLIN GREEN, Director, etc., R. P. I., Troy, N. Y. 1 8*

TO IRON FOUNDERS—Scotch and American Pig Iron. English Sheet Iron and Boiler Plates. Fire Bricks, Clay and Sand, and all kinds of Iron Founders' Facing Materials for sale by G. O. ROBERTSON, 135 Water street, (corner of Pine) New York. 1 6*

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 1 tf

NEW PATENT FLOUR AND GRAIN MILL—Patented June 6th, 1854. The subscriber is finishing the following mills: 8 twenty inch, price $100; 6 thirty inch, $200; 3 three feet, $300; 2 four feet, $400, and will pay $1,000 for any other mill as durable, simple, economical of power, which will grind as much from one dressing, which will heat the flour and meal as little, and is as easily kept in order. Cuts sent to post-paid applications, and liberal commissions allowed to agents for cash orders. EDWARD HARRISON, New Haven Conn., July 24th. sole owner of all interest in the patent right. 50 9*

JOHN PARSHLEY. manufaeturer of machinist's tools, No. 5 and 7 Howard street, New Haven, Ct., is now finishing a lot of iron planers to plane 8 5-12 feet long, 30 in. wide, and 26 in. high, having the down and angle feed in the cross head, the planers all of the best quality, and prices extremely low for the quality. Cuts with full particulars can be had by addressing as above, post-paid. 1 tf

STEAM ENGINE—80 Horse Power, for sale by the Lawrence Machine Shop. It is now driving the machinery in the Crystal Palace, and can be delivered the 1st of Nov., 1854. Apply to Gordon McKay, Treasurer, office 51 Broad street, New York, 47 State street, Boston; J. C. Hoadly, Superintendent, Office in Lawrence, Mass.: or David A. Clary, Selling Agent, Office at the Machinery Depot of the Lawrence Machine Shop. The Lawrence Machine Shop have now on hand Locomotives, Steam Engines, all kinds of Machinists' Tools, large Lathes (finished) for Locomotive Drivers and Planing Machines—that plane 3 feet square by 12 feet. Parker and Turbine Water Wheels, Wool Cards and Jacks, Shafting and Pulleys, &c., promptly made to order. A superior article fo Oak Tanned Sewed Leather Belting constantly on hand. Inquire as above. 1 4*

IRVING'S PATENT SAFETY CIRCULATING STEAM BOILER—For Stationary, Locomotive, and Marine Engines. These Boilers having been thoroughly tested by scientific experiment and practical use, are being rapidly introduced into every part of the United States. Their claims to superiority are fully supported by the united testimony of highly respectable parties, who have given them the most successful trials. The following are among the chief advantages of this Boiler: 1st. Great increase of heating surface, with diminution of bulk. 2nd, Economy of fuel—a saving of more than 50 per cent. being effected over other boilers. 3rd. Economy of space, compactness, and strength of form. 4th. Increased safety from explosion. 5th. Freedom from incrustation. Circulars obtained on application at the Company's Office. Boilers of any required power furnished on short notice. Rights negotiated for all parts of the United Staies, England, France, and Belgium.—All communications promptly attended to.

W. F. PHELPS,
45 3m* Sec'y Irving S. Boiler Co., 347 Broadway, N. Y.

KENTUCKY LOCOMOTIVE WORKS—Corner of Kentucky and Tenth streets, Louisville, Ky.—The proprietors of the Kentucky Locomotive Works would respectfully inform Railroad Companies and the public generally, that, having completed their establishment, they are now prepared to receive and execute orders with fidelity and dispatch. They will contract for Locomotives, Passenger, Baggage, Freight, Gravel, and Hand Cars, of every style and pattern, as well as all kinds of Stock and Machinery required for railroads.—Particular attention will be paid to Repairing, for which they have every facility. They are also prepared to contract on favorable terms for building all kinds of Machine Tools, such as Turning Engines, Laths, Planers, Drills, Slotting, Splining, and Shaping Machines of every variety of pattern. Having also a large Foundry connected with the establishment, orders for castings are solicited, and will be filled with promptness. Car Wheels of any pattern can be furnished on short notice. Double and single plate and Spoke Wheels of all sizes constantly on hand. Communications or orders must be addressed to OLMSTED, TENNEYS & PECK, Louisville, Ky. 40 6m*

MECHANICAL ENGINEERING—CHARLES EHMAN & CO., Consulting Engineers and Designers, 233 Broadway, New York. Designs, Working Drawings, estimates and contracts for high or low pressure steam engines (Ehman's improved vertical engine) Boilers, Pumps, Presses, Saw and Grist Mills, Tools and Machinery of every description. Particular attention paid to making drawings and working plans for inventions and models, to the construction of patent machines, etc., etc. Arrangements made, and plans furnished for putting up and locating Engines, Boilers, Shaftings, and all kinds of machinery in buildings, etc., etc. 51 8*

REYNOLD'S DIRECT ACTION and Re-Action Water Wheel—This is one of the most simple, cheap, and efficient Iron Water Wheels now in use. For description, cuts, &c., apply to SAML. B. LEACH, Agent, 60 Beaver st., N. Y. 45 13*

FOR GREASING MACHINERY—For all purposes of lubrication, "Metallic Oil" has many recommendations. Its tendency to remain on a smooth surface of metal, instead of running off or evaporating, its property of resisting heat and keeping the bearings of machinery cool, and its freeness from "gum," are important considerations with engineers and machinists. A fair trial will convince any unprejudiced person that it is a very valuable substitute for sperm oil.

For sale in quantities to suit purchasers by
YOCKNEY & CO.,
Sole Manufacturers of Cumberland Brothers' Patent "Metallic Oil," Elizabethport, N. J., office 67 Exchange Place, N. Y. 45 12*

READING'S PATENT CORN SHELLER and Cleaner—capacity 200 bushels per hour. 9 first premiums awarded in the Fall of 1853. Patent Rights and Machines now for sale at the corner of 2nd Street and Pennsylvania Avenue, Washington, D. C. I challenge the world to produce its equal. Address personally or by mail. WILLIAM READING. 43 13*

THE EUROPEAN MINING JOURNAL, Railway and Commercial Gazette. A weekly newspaper, forming a complete history of the Commercial and Scientific Progress of Mines and Railways and a carefully collated Synopsis, with numerous Illustrations of all New Inventions and Improvements in Mechanics and Civil Engineering. Office, 26 Fleet Street, London.—Price $6 1-2 per annum.

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc.

CHARLES W. COPELAND,
1 tf Consulting Engineer, 64 Broadway.

THE MERIDEN MACHINE CO.—Successors to Oliver Snow & Co., West Meriden, Conn. Have on hand and make to order a great variety of Lathes, Planers, and other machinists tools of superior quality and finish. Cuts of these tools may be had on application as above, with full particulars. They also manufacture Farnam's Patent Lift and Force Pumps of all sizes. For mines, factories, railroad stations, &c. Having a large and extensive variety of patterns, the accumulation of over 20 years business, and extensive facilities for making light or heavy castings, are prepared to contract for any kind of mill work, mining machinery, &c. New York Office and Sample Room, No. 15 Gold, cor. Platt st. 1 3m*

PHŒNIX IRON WORKS—GEO. S. LINCOLN & CO., Hartford, Conn. Manufacturers of Machinists Tools. Are constantly making and have now on hand an assortment of Screw Cutting Engine Lathes, viz.:—No. 1. bed 10 ft. long, swing 20 inch. No. 2. bed 14 ft. long, swing 30 inches. No. 3. bed 16 1-2 ft long, swing 40 inches, with improved bed, cast steel spindles, feed motion carried by a screw, toothed rack for moving tool rest by hand, improved gibb rest and tool stock, stationary and traveling back rest; also manufacturers of Lathes for turning Locomotive Driving Wheels, small Power Planers, Upright Drills, Power Punching Presses, &c. Designs of the tools with further descriptions, will be sent by addressing as above. 1 3m*

LEONARD & WILSON—No, 60 Beaver st., and 109 Pearl st., have constantly on hand and for sale a full assortment of Machinists' and Carpenters' Tools, embracing every variety of Engine and Hand Lathes, Iron Planing Machines, Mortising and Tenoning Machines, Wood Planers, &c. Also Leather Belting of all sizes made of the best oak tanned butts, stretched on powerful machines, riveted and cemented. 42 13*

NORTHVILLE MACHINE WORKS—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass.. August 9, 1854. TAFT & GLEASON. 50 1y*

NORCROSS' ROTARY PLANING MACHINE—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.

Rights to use N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.

The printed report of the case with the opinion of the Court can be had of Mr. Norcross, at Lowell, or 27 State street, Boston. 36 6m*

MACHINISTS TOOLS—SHRIVER & BRO., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes Iron Planers, Drills and other machinists tools 50 6m*

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Science and Art.

(For the Scientific American.)

On Sumach.

Having read articles in the daily press on sumach, and observing they conveyed no correct information to the cultivator, I have sent you the following essay on the subject. Sicilian sumach is imported largely into the country from Messina and Palermo, and some of inferior quality, grown in Germany, from Trieste; and if the sumach of this country can supply its place, the object would be worthy the attention of our citizens. Most of the following observations have appeared in print, some years since, under my signature.

Sumach is extensively used in morocco tanning, in calico printing and dyeing.—There are three species used in dyeing—the Rhus Glabrum, the Rhus Coriæria, and the Rhus Cotinus. The two first only are used in tanning. The first is the common sumach of North America, and is much used by our country dyers, and, to a limited extent, by our tanners. The annual shoots or peduncles, with their leaves, are gathered, and in this country are mostly used without grinding. A writer in one of the New York papers gives directions to grind the wood of this shrub with the leaves and annual shoots, but this would so injure the quality as to render the mass of little or no value.

It is well known that the most astringent vegetables, or those containing the largest portion of gallic acid, are brought from warm climates, and the following facts will prove that the quality of the sumach depends on the warmth of the climate in which it grows. The sumach in Europe is the Rhus Coriæria. That which is grown in the north of Europe, and imported from Trieste, is no better than our northern sumach, excepting a small portion grown in the Tyrol, and even this is not superior to the best American grown in New Jersey; whereas that grown in Sicily, Syria, Spain and Portugal, where it is cultivated with great care, is found by experience to be vastly superior to that from Trieste, and sells much higher. A similar difference is observable in the sumach grown in this country. That from the southern side of New Jersey is superior to the New York, and that from Virginia to the New Jersey; and there is no doubt that if raised in the Southern States, dried with care, and ground fine, it would be equal to the best imported.

Sumach should be cut or gathered in clear weather, and should be so spread on a floor as to dry rapidly, for if only a small part should ferment, the whole mass will be seriously injured. It should be finely ground when dry, and packed in bags. No rain or dew should fall on it after cutting, for even the damp from the hold of a ship will greatly injure its quality.

I have been informed that our sumach will not reproduce from the seed, and if this be true there would be some difficulty in extending the article to a great extent by field cultivation. Sumach is said to be hybridous, in which case plants from Sicily planted among our glabrum, would enable the seed of both to reproduce, and in this way might be extended at pleasure. Mr. George Woodward, however, has sent the seed of our glabrum to England, and there it reproduces very readily,

The Rhus Cotinus, or Venice sumach, is also an important article in dyeing. It is known in England as young fustic, the stem and trunk of the shrub, and the root, are extensively used in Europe for dyeing golden and orange yellows. The leaves and stalk, when bruised, have an aromatic, but pungent and acid scent.

This plant is grown in our nurseries, and sold as an ornamental shrub. It is by some called the fringe tree, and by others the burning bush; at least such have been the names given me by inquiring of the owners. It bears a large drab-colored flossy blossom, and grows luxuriantly in many of our shrubberies.

The Cotinus is cultivated by layers. The stalks sent to market in Europe are from one to two inches in diameter, with the bark taken off. There is considerable white sap outside, and dark yellow and orange-colored rings inside, the latter being the coloring matter. The leaves from this wood, when cut, are gathered, dried, and ground with the other sumach.

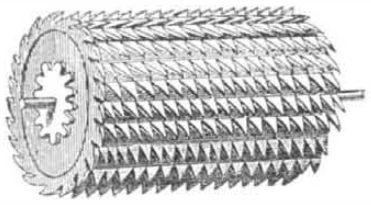
WM. PARTRIDGE.

Binghamton, N. Y.

History of Reaping Machines.—No. 2.

In Vol. 4, page 205, of the *Annals of Agriculture and other Useful Arts*, collected and published in 1785, by Arthur Young, F. R. S., &c., appears what is believed to be the earliest proposal for a mechanical reaping machine in Great Britain. In Vol. 8, page 161 of the same work, published in 1787, there is an account of a reaping machine, suggested by the descriptions in Pliny and Palladius, and invented by William Pitt, of Pendeford. It consisted of a reaping or rippling cylinder, composed of numerous parallel rows of curved teeth, illustrated in the annexed cut.

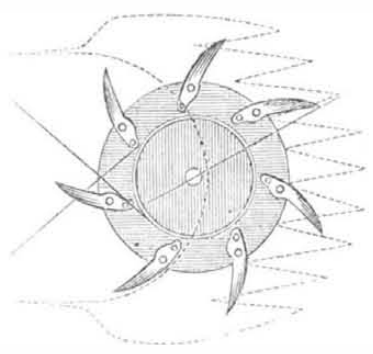
FIG. 5.



This tooth cylinder is suspended in front of a two-wheel car, and motion communicated by means of a pinion and cog-wheel, connected to the car wheel by a band and pulley; the iron combs of the cylinders hatcheling off the heads of grain, and dropping them into the box behind.

In Walker's *System of Philosophy in Twelve Lectures*, published in 1799, there is a description of a reaping machine, though by whom invented, or when, does not appear. The movement of the cutters is represented as being circular and advancing, and the shape of which is illustrated by fig. 6.

FIG. 6.



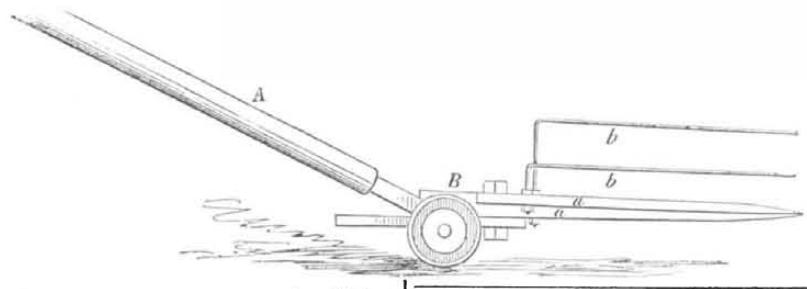
This knife wheel is put in motion by a pulley fixed on its axle, and made to cut like shears against the sharp edges of steel points projecting beyond it into the standing grain, the cut wheat being removed from the platform by a lever attached to the axle of the cutter wheel. The whole is pushed forward by a horse.

The first patent for a reaping machine, in England, was obtained by Joseph Boyce, of Pine Apple Place, Mary-le-bone, on the 4th of July, 1799. The arrangement of the cutters was like the accompanying fig. 7, and similar in principle to that described by Walker, though not identical with it.

Fig. 7.

On the 20th of May, 1800, letters patent were granted to Robert Mears, of Somersetshire, for a machine reaper. This was an apparatus worked by hand, although propelled upon wheels, aptly illustrated by fig. 8, prepared from the recorded specification, no drawing having been appended.

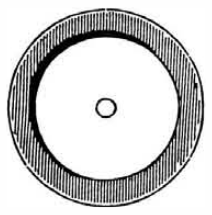
FIG. 8.



A are two handles which work two blades, *a a*—simply a large pair of shears on wheels, B. *b b* are two metal fingers, the one having a crook in it folding over the over. When the shears are thrust forward, the fingers hold the grain to their action, the top one bending the grain to the one side to let it fall when cut, in clips or gavels, all in one direction.

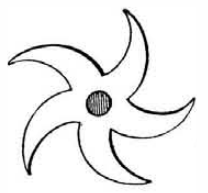
On the 15th of June, 1805, Thos. J. Plucknett, of Kent, Eng., obtained a patent for a reaping machine, in which the power was placed behind, and the cutting apparatus suspended beneath and forward of an axle connecting two large driving wheels and worked by gearing. The cutter was a plane circular smooth-edged plate, like fig. 9.

FIG. 9.



Mr. Plucknett obtained a second patent in 1807, for an improvement on his machine, which consisted mainly in a change in the form of the cutter as in the annexed fig. 10.

FIG. 10.



The Valley of Flowers.

E. Merriam, who has been on an exploration tour to Canada, gives a description of what must be a lovely valley, in his correspondence to the Portsmouth, N. H., *Journal*. A few miles from the Indian village of Rice Lake, C. W., he says:

"We reached the "Land of Flowers," and although the middle of September, and the season of frost in low places, this land is covered with flowers, and the air filled with their fragrance. My companions, who reside in this section of the country, inform me that these plains have a new set of flowers for every month between frost and frost.

I passed over this same district ten years ago last July, and then it was like a garden. The rose bushes are as plenty here as the whortleberry bushes are upon the hills of New Hampshire, and in the season of the blossom of the rose must appear like an enchanted land. This strip of the land of flowers varies in width from two to four miles, and in length from sixty to seventy miles. I crossed the plain which constitutes this land of flowers about twenty miles further west on the new railroad which extends from Coburg to Rice Lake. There I found the summit-level of these plains at the lowest elevation they could find for the road, 657 feet above the surface of Lake Ontario, at a distance of about eleven miles from its shore; and what is singular, I found a spring of water at the very summit."

Curious Spring.

While the laborers were recently engaged at an embankment on the Petersburg and Richmond Railroad, they suddenly struck upon a large stream of water which gushed out upon the track, and emitted a vapor having the scent of half a dozen chemical laboratories combined. The Petersburg *Express* recommends invalids having weak stomachs to try a quart of the water every morning before breakfast.

LITERARY NOTICES.

THE BETTER LAND—Gould & Lincoln, of Boston, have published in a very neat volume, the above named work, by the Rev. Augustus C. Thompson, of Roxbury, Mass. It is composed of meditations thrown into the form of essays, on the journey of the Christian to that land where Christ has gone to prepare for him a mansion. It is written in a glowing style, and a deep devotional spirit pervades every line of it. It is a gem for the faithful christian.

THE CULTIVATION OF THE STRAWBERRY—To R. G. Pardee as author, and C. M. Saxton, of this city, as publisher, we are indebted for this very useful and well written little work, on the culture of this excellent fruit. There is also an appendix which describes the best varieties of the grape, currant, blackberry, raspberry, and gooseberry. It is a valuable treatise on a subject in which every man is interested who holds twenty feet square of soil as a garden.

ELEMENTS OF AGRICULTURE—This is a respectable little treatise by the same publisher, being a translation of the French work of Bentz, by F. G. Skinner.

MANAGING BEES—This is another little volume by the same publisher, being a new edition of the Manual of Weeks, revised by Wooster A. Flanders, of Vermont. These two works are sold for twenty-five cents each, a price which is within the reach of every person, and which is very low for such excellent works. Mr. Saxton deserves the praise and patronage of our agriculturists for the many cheap and excellent works which he has published, on subjects relating to the rural arts.

PUTNAM'S MONTHLY—This sterling original American Magazine for October, is a choice number. The first article is a biography of Count Stedingk, a Swedish officer, who fought in the French army during our revolutionary war. It contains a thrilling account of the attack on Savannah, and some curious reminiscences of the Order of Cincinnati to which he belonged.

LITTELL'S LIVING AGE—This old and meritorious weekly magazine, composed of selections from the best reviews and magazines of Europe, commences a new volume with the number for this week. Every number is illustrated with a fine steel plate, the present one being "The Death of Medora." This number contains nine articles, the first being a review of "Nolte's Fifty Years in Both Hemispheres." The office in this city is 343 Broadway.

THE NAUTICAL MAGAZINE—The first number of the above named Magazine has just been issued by Griffiths & Bates, of this city. It is devoted to nautical matters—ship-building especially; its editor, Mr. Griffiths, being the author of several excellent works on the subject. It appears to be ably edited, and we heartily wish it may meet with abundant success.

Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

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